



*National*



*Health Information Management*



*and*



*Information & Communications Technology*



*Strategy*

## NOTES FOR READERS

In reading this document please be aware of the following points:

1. **'National'** in the context of this report refers to the cross-jurisdictional (Australian and state and territory governments and other agencies, public and private) and cross-sectoral health information management and information and communications technology (IM&ICT) agenda and priorities that require co-ordination. It is the agenda for which the National Health Information Group (NHIG) and Australian Health Information Council (AHIC) currently have responsibility.
2. Given the short timeframe for this review, we have drawn heavily on existing knowledge and expertise in many health IM&ICT areas. As far as possible, we have tried to avoid reinventing the wheel. A list of the reports and documents used is included in the bibliography (see appendices).
3. Our survey of the existing project landscape is largely confined to projects that are being undertaken or are sponsored by the Australian Government or state and territory governments. It was not possible to comprehensively cover private sector activity, although we did speak with a number of stakeholders from the private sector.
4. Several issues are outside the scope of this report. These include an estimate of total funding requirements to support the realisation of an electronically enabled healthcare system.
5. This review is a key element of the national health IM&ICT strategy development process being undertaken by the National Health Information Group (NHIG) and the Australian Health Information Council (AHIC). Priorities will be further tested and refined over the next few months, before the strategy is presented to the Australian Health Ministers Conference (AHMC) for approval.

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# CONTENTS

<b>Executive Summary .....</b>	<b>6</b>
<b>1 Introduction .....</b>	<b>17</b>
<b>2 Background and Context .....</b>	<b>19</b>
2.1 Hurdles to Achieving the Vision .....	19
2.2 Progress Made to Date .....	20
2.3 The Case for National Action .....	22
<b>3 Review Scope and Approach.....</b>	<b>24</b>
3.1 Scope .....	24
3.2 Approach .....	24
3.2.1 Step 1: Categorise Capabilities Required .....	25
3.2.2 Step 2: The National Role .....	27
3.2.3 Step 3: Assessing Priorities .....	29
3.2.4 Step 4: Feasibility of Implementation .....	30
3.2.5 Step 5: Defining The National Role .....	30
<b>4 Findings .....</b>	<b>31</b>
4.1 Stakeholder Requirements .....	31
4.2 Current IM&ICT Project Landscape .....	35
4.2.1 Project Mix, Volume and Size .....	35
4.2.2 Project Expenditure .....	37
4.2.3 The Business Case Challenge .....	39
4.3 National Priorities .....	40
4.4 Other Initiatives .....	43
4.4.1 Electronic Decision Support .....	44
4.4.2 Broadband Roll-out .....	45
4.5 Obstacles and Challenges .....	45
<b>5 Recommendations .....</b>	<b>50</b>
5.1 Expectations Management of the Vision for Health IM&ICT .....	50
5.2 National Priorities and Implementation Pathways .....	52
5.2.1 Data Standards .....	53
5.2.2 Privacy Standards .....	55
5.2.3 Patient Identification Standards .....	56
5.2.4 Provider and Patient Directories .....	56
5.2.5 Technical Integration Standards .....	57
5.2.6 Clinical Information Systems and Patient Administration Systems .....	58
5.2.7 Electronic Health Records .....	59
5.2.8 Information Transfer and Secure Messaging .....	60
5.2.9 Authentication and Access Control .....	61
5.2.10 Data Linkage For Research .....	62
5.3 Timetable for Rollout .....	63
5.4 Funding .....	65
5.5 Implications For Governance Arrangements .....	66
5.5.1 Strengthened Governance Arrangements .....	67
5.5.2 'Strawman' Independent Health IM&ICT Entity .....	71
<b>6 Next Steps .....</b>	<b>76</b>

<b>1</b>	<b>Appendix .....</b>	<b>77</b>
1.1	Glossary of Terms and Acronyms.....	78
1.2	Capability Definitions .....	80
1.3	Approach For Identifying Priority Projects.....	83
1.4	Major Project Data Collection Template .....	84
1.5	National Capability Prioritisation Matrix – Background Data .....	86
1.6	Stakeholder Interviewees.....	87
1.7	Bibliography .....	89

## Executive Summary

This report summarises the major findings and recommendations from a seven week review by The Boston Consulting Group (BCG) on behalf of the National Health Information Group (NHIG) and the Australian Health Information Council (AHIC). The report is intended to be a key input into a national strategic plan for health-related information management and information and communications technology (IM&ICT) that will be presented to the Health Ministers later this year.

Our brief was to review the current portfolio of health IM/ICT projects, help prioritise the 'national' agenda, and provide suggestions to help gain traction on the agenda.

### Case for Coordinated National Action

Many local and international studies have identified a better connected health system as a crucial element of health reform. Such reform needs to be directed towards improving health outcomes while containing cost increases driven by advances in medical technologies and an ageing population. More interoperable systems and data are central to achieving these objectives, and would provide clear benefits for all health stakeholders:

- Providers could make better informed clinical decisions more efficiently, adverse events would be reduced and unnecessary procedures could be avoided;
- Administrators could make more efficient and effective use of resources;
- Researchers could more effectively analyse disease pathways and the effectiveness of various interventions to help inform health policy and practice;
- Policy makers and funders could more effectively direct their funding towards interventions that produce the most effective health outcomes; and
- Patients – particularly those with chronic diseases – would benefit from improved health outcomes, better access to their own health information, and less complex interactions with providers across the healthcare sector

The need to build an interconnected health system in support of health reform is especially strong in Australia, where responsibility for health care provision is split across governments and the private and public sectors. Some initiatives can be advanced independently by the various jurisdictions, but in the areas of systems and information interoperability national co-ordination is essential. We therefore believe there is a strong case for decisive national action in priority areas of health IM&ICT.

A nationally coordinated effort is the most cost-effective path forward. The Canadians estimate, for example, that a national effort to standardise electronic health data would cost half the amount needed if each province were to head in this direction independently<sup>1</sup>.

Delivery of a better connected health system will result in system-wide cost benefits, although these are difficult to quantify given the indirect and diffuse nature of the benefits. Various attempts have been made to quantify these benefits and develop business cases. The Healthcare Information and Management System Society (HIMSS)<sup>2</sup> in the US estimates net savings in excess of \$87b per annum from standardised electronic health data alone. In addition, work jointly commissioned by the Australian and Tasmanian Governments in relation to a state-wide rollout of HealthConnect has outlined a business case for creating standard electronic health records.

There is a strong case for decisive national action now. After years of under-investment, most states and territories are about to begin major reinvestment in their hospital systems. If this reinvestment includes the adoption of common standards where they matter, this will provide part of the platform for interoperability across the health network. If not, we may create a major 'rail gauge' problem that will significantly set back health system reform for years to come.

### **Health IM&ICT Progress to Date**

Australia has made progress in health IM&ICT, on the basis of several federal-state initiatives and independent work in each jurisdiction. The major federal-state initiatives include:

- The National Health Information Agreement in 1993, which laid the foundation for the collection of consistent health data sets and the AHMAC endorsed National Health Data Dictionary;
- The establishment in 1993 of the National Health Information Management Group (NHMIG) that oversaw the development of national statistical data standards;
- The release in 1999 of *Health OnLine: A Health Information Action Plan for Australia*, a national strategic information action plan, followed by the establishment of the electronic health record project HealthConnect;
- The establishment of the National Health Information Management Advisory Council (NHIMAC) to supervise national projects and standards development in ICT;

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<sup>1</sup> BCG interviews with Infoway (2004)

<sup>2</sup> The Centre For Information Technology Leadership, Feb 2004

- The merger of the ICT and IM governance arrangements with the creation of NHIG (representing the jurisdictions) and AHIC (an expert advisory group) in 2003.

These initiatives, in conjunction with independent work by the various jurisdictions, have resulted in much activity in the health IM&ICT area. We identified over 360 current or planned health IM&ICT projects across the jurisdictions, about which the following observations can be made:

- The average project size appears small, consistent with the common stakeholder view that funding is spread thinly across many priorities;
- The large number of projects in some areas, such as Patient and Provider Directories, suggests that the various jurisdictions feel obliged to move independently in the absence of a national solution;
- Decision-making is frustratingly slow in some important areas, such as the adoption of an Australian health messaging standard and various health terminologies, reflecting unclear lines of responsibility.
- Given the significant planned investment<sup>3</sup> (over \$350m) over the next 2 years by the states and territories towards overhauling their hospital systems, the adoption of common standards now will create major benefits later.

## **Obstacles and Challenges**

Despite high expectations and a lot of activity, many stakeholders are frustrated about progress towards a fully interoperable health system. They cite a number of obstacles:

- Fragmented accountability for progress, with much of it resting with part-time committees – often with no full-time staff;
- Difficulties in convincing central agencies in each jurisdiction to fund important initiatives – this is partly because it is difficult to prepare persuasive business cases, given diffuse, cross-system benefits and long timeframes;
- Underestimation of the change management task in persuading health professionals to embrace new approaches to managing and using information – when budgets are trimmed, investment in change management is often cut further and the prospects of success reduced;

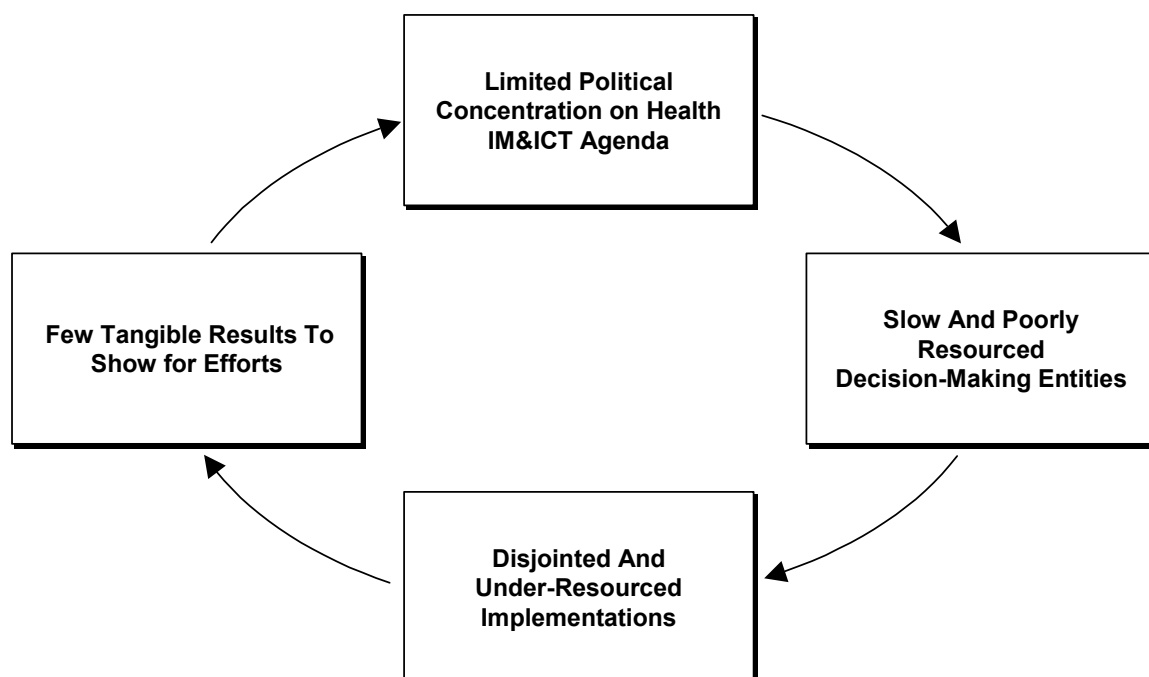
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<sup>3</sup> Estimated 2 year expenditure from BCG Health IM&ICT, portfolio review



- Limited access to computers and terminals at the clinical ‘coalface’ further hindering uptake of electronic reforms;
- Poor broadband network access, particularly in rural and remote areas; and
- Low visibility of IM&ICT in the political arena, leading to a ‘policy doom loop’ as illustrated below.

### ***A Health IM & ICT Policy Doom Loop***



### **Recommendations**

Action in four areas is critical to further progress on a national health IM&ICT agenda

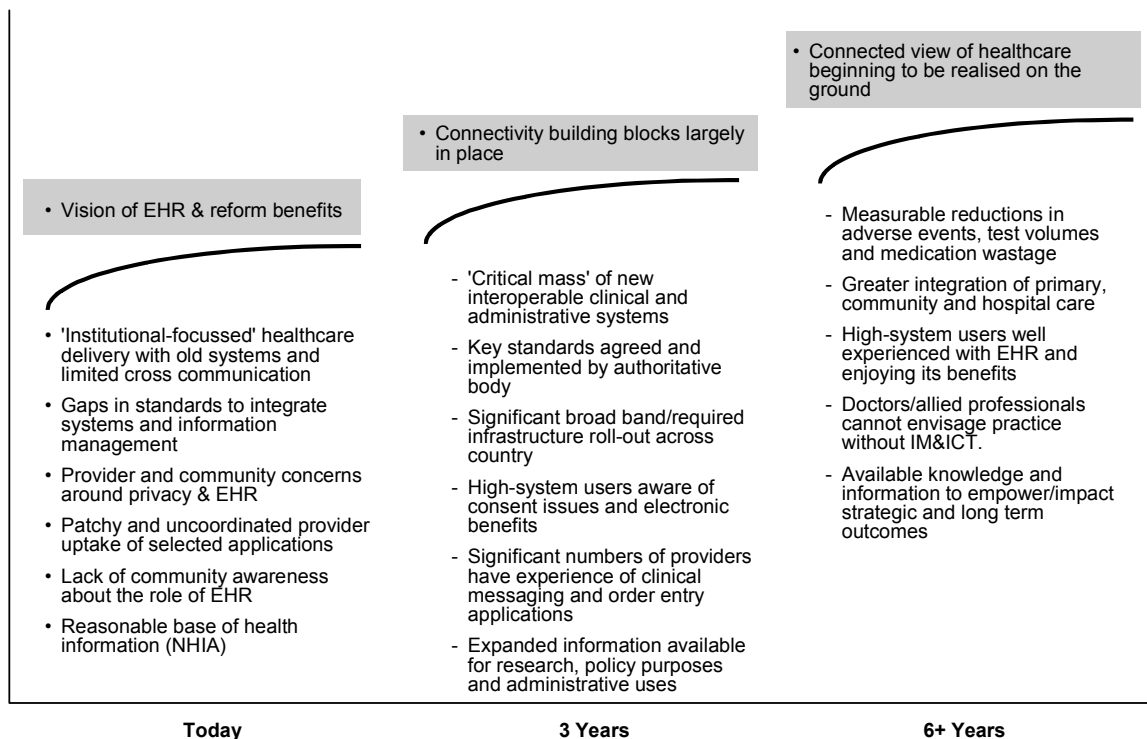
1. Alignment of expectations as to what is achievable, and an agreed path to get there
2. Agreement on national priorities and the national role in relation to those priorities
3. Adequate funding to address those priorities
4. A strengthened governance model

## 1. Alignment of expectations as to what is achievable and an agreed path to get there

Many stakeholders want better and more realistic management of expectations of health IM&ICT, an agreed pathway and set of priorities to get there, and commitment in the short term to deliver on the fundamental building blocks to ensure system connectivity.

The figure below suggests a phased vision for health IM&ICT over the short to medium term. It is not comprehensive, but attempts to set out some realistic outcomes for the next 3 to 6 plus years.

### The Vision for Health IM&ICT



## 2. Agreement on national priorities and the national role in relation to those priorities

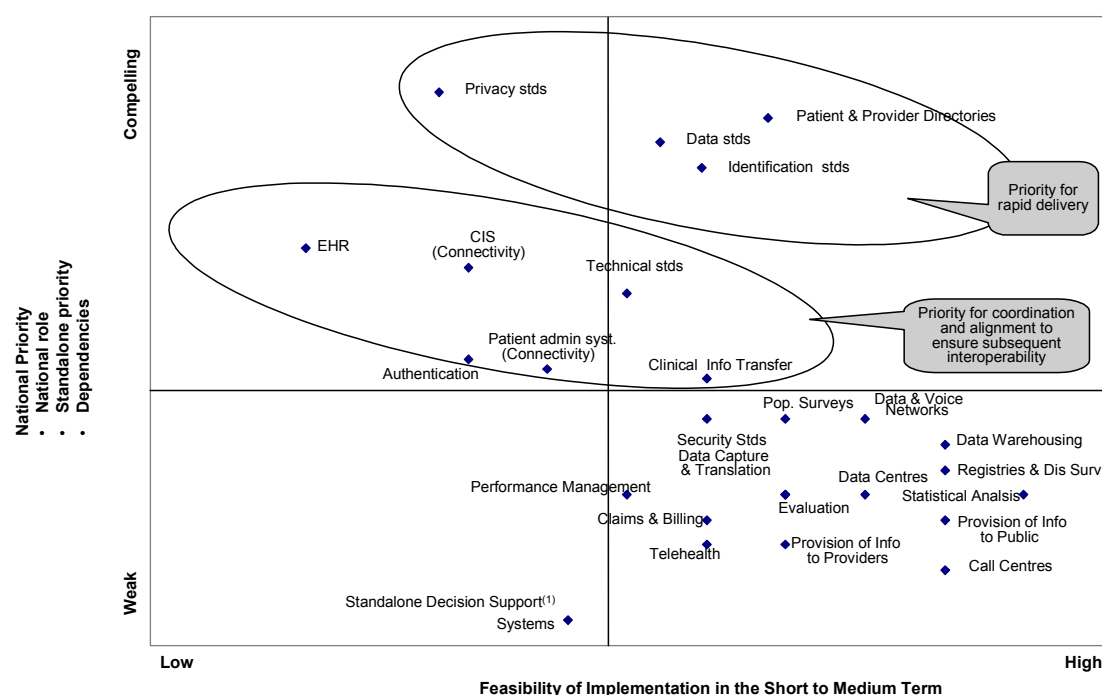
The health sector is fragmented, with decision-making devolved to the state or, in many cases, the sub-state level. Although bodies such as AHMC and AHMAC provide cross-jurisdictional coordination, they have no authority to make final decisions. Consequently, what little national leverage exists needs to be focused on those areas where it can make a difference, in terms of both costs and outcomes.

The areas that we have identified as national priorities are those that are most likely to support connectivity between the different parts of the health system. Other priorities clearly exist but do not require national coordination.

In determining the national priority areas we considered four factors:

- The benefits of national coordination
- Level of standalone importance as rated by stakeholders
- Extent to which other important initiatives depend on this priority
- Feasibility of implementation in the short to medium term.

Our assessment of stakeholders' priorities is shown in the figure below:

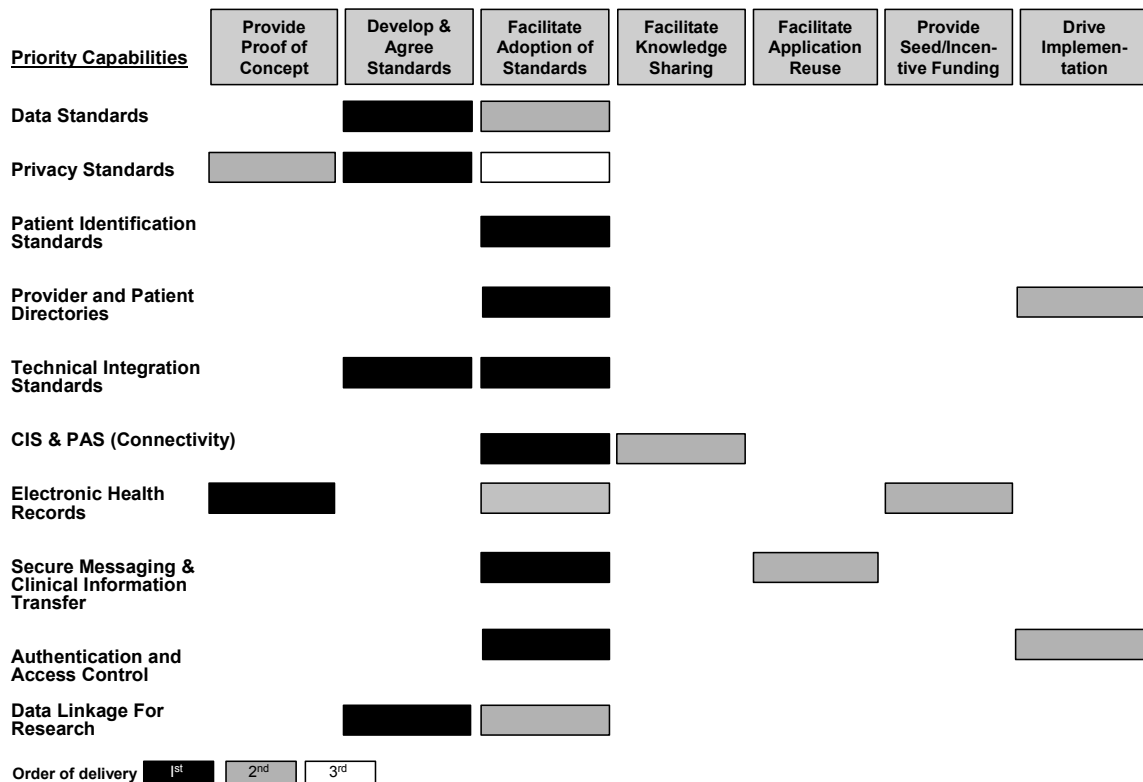


In addition, 'data linkage for research' was also identified as a priority. This, amongst other things, relies on multiple capabilities such as reusing data for research/other purposes (within a privacy/consent protocol and statistical analysis) as well as supplementing information from population surveys etc.

Two other potential priority areas warrant comment. These are integrated decision support functionality, which should be advanced in the context of knowledge accreditation and the priority area 'clinical information transfer and secure messaging', and the broadband roll-out. The latter being a national cross-sectoral initiative as the issues and benefits of broadband span multiple sectors, including but not confined to health.

On the basis of these priorities, we identified appropriate national tasks, as shown below.

### ***Proposed National Focus Going Forward***



### ***3. Adequate funding to address those priorities***

A firm recommendation on the appropriate level of funding required to deliver the national health IM&ICT agenda is outside our brief. However, we believe:

- The quantum of national funding will have a major impact on the pace at which we can proceed towards an electronically enabled healthcare system. Meeting stakeholder expectations of reasonable progress to outcomes will require significant investment.
- There is an urgent need to develop a realistic view of the funding required to deliver health system reform through IM&ICT in the short to medium term. Relative to other nations, Australia appears to be under-investing in this area.

### ***4. A strengthened governance model***

Extensive cross-jurisdictional effort, clear accountabilities and appropriate resourcing will be needed to achieve real progress in the high priority areas. We do not believe that the current NHIG/AHIC governance arrangements fully meet these requirements. In particular:

- Accountability for achieving progress is diffused across the committees and in some areas is left in the hands of a few passionate enthusiasts;
- HealthConnect and MediConnect have had mixed support from the states, in part because, while they technically report through NHIG/AHIC, they are in reality driven by the Australian Government, out of the Australian Department of Health and Ageing;
- The nature of the committees involved does not provide the flexibility needed to adjust priorities on an ongoing basis;
- Decision making is impeded by committee meeting cycles, lack of delegated authority to the committees and the complexity of the business transacted in meetings;
- The ability to coordinate the various activities is limited by the very light resourcing of the NHIG/AHIC secretariats;
- Resources are not available to proactively engage stakeholders between meetings;
- Access to expertise is limited;
- Focus is diffuse; and
- Funding is not adequate

Given the short timeframe for this review, we cannot recommend a definitive model for a new health IM&ICT entity. However, we have developed a 'strawman' to help stimulate discussion among key stakeholders.

We believe that a new entity with full-time staff needs to be established to take accountability for driving the national IM&ICT agenda forward.

The new entity needs to build on the strong commitment to national collaboration and early trust established by NHIG and AHIC since their creation late in 2003. Such a body should assume executive decision-making powers and accountability for the majority of NHIG's existing responsibilities, including its standing committees and working parties. Some, if not all of these, will continue to exist, but would be guided and resourced by the new entity. This accountability should extend to HealthConnect. A reconstituted NHIG would still be required to advise AHMAC on policy issues and as an important reference body to the new entity, to ensure that it remains closely in touch with the views of all jurisdictions. AHIC should continue in its current expert advisory role.







The new body should be focused on national priorities in health IM&ICT initially (as determined by AHMC, advised by AHMAC), without broader healthcare responsibility. It should be directly accountable for the delivery of certain outcomes, contracting with relevant parties and jurisdictions as appropriate. For example, the Australian Institute of Health and Welfare (AIHW) could presumably continue to be contracted for some data standards development work and population health studies, as could the HIC on patient and provider identification issues.

The proposed new entity should have the following characteristics:

- It should play a strong communication and advocacy role on national health IM&ICT priorities. This includes setting clear expectations for all initiatives, reporting on progress (and any issues affecting progress) and formally evaluating major development and implementation initiatives. These learnings should be shared and applied across jurisdictions as appropriate.
- It may need to assume responsibility for knowledge and system accreditation, if this is deemed essential for delivery on national priorities. This may be required in some areas of standards (as identified in the national implementation pathways section above) and to ensure a robust electronic knowledge base to underpin clinical systems.
- One of the entity's main roles would be to review and make recommendations on the level of funding needed to deliver desired outcomes in appropriate timeframes. Obvious trade-offs would need to be made about the pace of reform and the level of investment.
- Once the entity is established, it could become a national expert reference centre for important areas in health IM&ICT. This would primarily be a by-product of the entity's core activities in advancing the connectivity agenda. As such, it could include areas such as health IM&ICT business case development, evaluation/research informatics and key aspects of provider change management.

The key differences between today's governance arrangements and those proposed for the new independent entity are summarised in the exhibit below.

## ***A Governance Comparison: Today Versus a New Independent Health IM&ICT Entity***

Today's model		New Independent Entity
Part time committees, with part time secretariats		Full time team with full time change manager as CEO
Significant burden on committees to reach decision on complex issues. Diffuse accountability		Takes accountability for delivering against timelines
Limited ability to proactively manage across stakeholders		Proactively interacts and manages stakeholders to maximise prospect of gaining agreement
Decisions need to be batched for key committee meetings		Able to coordinate across projects on an ongoing basis
Limited resources allocated across committees and reviewed infrequently		Able to review progress of teams and adjust resourcing allocation on an ongoing basis.
Limited capability to ensure follow through on decisions		Able to follow through on key decisions to drive implementation

The entity should be established for a finite period – say, 5 years. It should be expected to achieve certain milestones, as defined by the national priorities and timeline, by the end of each year of its operation. Its future beyond its initial 5-year life should be determined on the basis of its track record. As a safeguard, a formal external review of its performance should be conducted three years into its life.

An intergovernmental agreement would be required to establish the new entity as an independent body. It need not be a statutory authority, but could have a company structure to ensure adequate fiduciary responsibility.

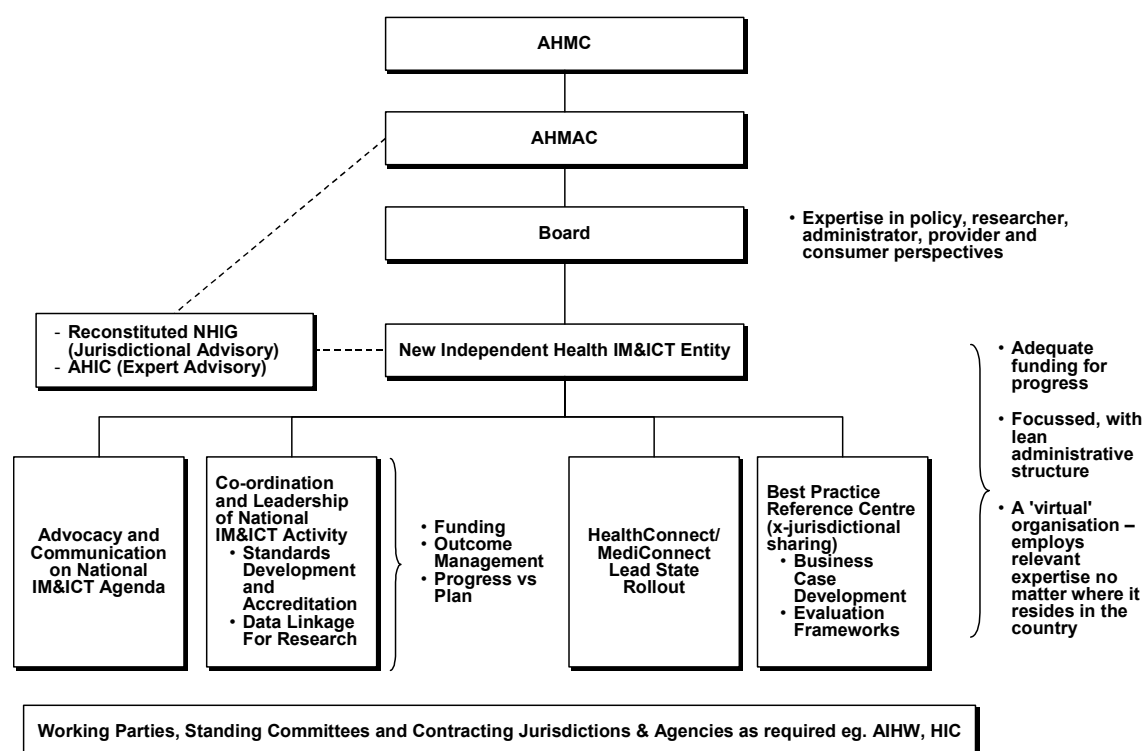
The entity should report through the Australian Health Ministers' Advisory Council (AHMAC) to the Australian Health Ministers' Conference (AHMC). Its reporting should include its strategic direction, budget approval and progress against agreed key performance indicators. The entity's board should also be selected and appointed by the AHMC advised by AHMAC. Its formal authority will derive from agreement on its strategy and budget by all Health Ministers meeting in AHMC.

In practice, the new entity would have no capacity to direct jurisdictions to pursue certain courses. Its success would depend on its powers of persuasion and encouragement, backed up by some financial inducement. In addition, the entity's performance in meeting agreed goals would be publicised. The quality of the board and the personal capacity of the CEO would largely determine the new entity's success.

Funding for the proposed entity would be provided through a joint Commonwealth Government and state and territory government funding initiative. The agency would be responsible for all the allocation of national health IM&ICT funding – for example, the recently announced funding to support the next phase of the HealthConnect rollout to 2007 would be channelled to the new entity.

The exhibit below summarises the potential governance arrangements, roles and responsibilities of the new entity.

### Strawman Model for an Independent Health IM&ICT Entity



### Health System at a Cross-Roads

A fair amount of progress in health IM&ICT has been achieved over the last decade, yet Australia's desire for an interconnected health system remains largely an unrealised vision today.

If the priorities articulated here are agreed and the governance issues addressed, then in three years' time, we can expect to see the building blocks for an interoperable health system largely in place. Some cross-system applications, such as an integrated electronic health record, will also be in use in some areas. The foundation will have been laid for significant healthcare reform based on a more effectively networked system.

If not, we can expect to see another three years of frustration and limited progress, and the creation of a 'rail gauge' problem that will have significantly delayed prospects for system reform.



# 1 Introduction

This report summarises the major findings and recommendations from a review undertaken by The Boston Consulting Group (BCG) on behalf of the two new national responsible bodies – the National Health Information Group (NHIG) and the Australian Health Information Council (AHIC). Together NHIG and AHIC are responsible for overseeing the development of a national strategic plan for health-related information management and information and communications technology (IM&ICT).

The review, which was conducted over 7 weeks from January to March 2004, is the first step in the development of a revised national health information management and communications technology strategy. Further consultation and refinement will take place before the strategy is presented, through the Australian Health Ministers' Advisory Council (AHMAC), to the Australian Health Ministers' Conference (AHMC) for approval in late 2004.

The review had the following specific objectives:

- Review the scope, funding and timetabling of existing, significant government (national and state) and private sector health IM&ICT projects and activities;
- Provide advice on any overlap and duplication of effort in the context of current arrangements and activities;
- Provide advice on priority areas for national action concerning IM&ICT projects, including advice on the key building blocks required to underpin any health information initiatives in accordance with priority health outcomes;
- Provide advice on priority areas for national policy development in health-related IM&ICT;
- Provide advice on gaps in the current effort and opportunities to better target, integrate and focus national effort and resources;
- Identify key interdependencies and linkages between priority projects;
- Identify the key stakeholder organisations and other committees that have a role to play in national health-related IM&ICT activities; and
- Provide advice on the timetabling of national effort.

In the course of the project, BCG surveyed all Australian jurisdictions to identify major health IM&ICT initiatives that are planned or in progress. This snapshot of the project landscape has been reviewed, and where possible benchmarked, to understand current areas of significant investment, areas where there is existing or potential duplication of effort, and gaps in investment relative to priorities. BCG also conducted stakeholder interviews to help establish the short to medium term priorities for health IM&ICT. Appendix 1.6 includes a full list of the organizations and individuals consulted.

## 2 Background and Context

A national health information strategy is intended to realise opportunities in IM&ICT that will deliver significant health system reform. The primary objective of this reform is twofold – to provide better healthcare outcomes for Australians, in particular, enhanced safety and quality, and to improve the cost efficiency of service provision.

Both Australian and international studies support investment in health IM&ICT as a fundamental component of system reform. Such investment is intended to improve health outcomes while helping to offset the health cost increases expected as a result of advances in medical technologies and pharmacology, and the inevitable aging of the population. In addition, improving the collection, management and dissemination of health information will boost administrators' and policymakers' ability to undertake informed, system-wide planning, resulting in more effective and efficient deployment of health resources.

Case studies on the uptake, feasibility and cost benefits of interoperable health IM&ICT are increasingly being published. For example, the Healthcare Information and Management System Society (HIMSS) in the US estimates net savings in excess of US\$87 billion per annum from standardised electronic health data alone<sup>4</sup>. Implementation of an integrated medical records and electronic decision support system by US-based Kaiser Permanente showed significant outcome benefits – a 25-30% decline in heart disease related hospital admissions and cardiac mortality. Provider endorsement and benefits have also been reported, as evidenced by British Columbia's experience with Pharmanet (a shared electronic prescribing, medications information and drug claims service for pharmacists).

### 2.1 Hurdles to Achieving the Vision

Many stakeholders in healthcare share a vision for a connected health system. However, this is far from today's reality. Healthcare is largely delivered by independent institutions and providers; consumers have to navigate a complex, often difficult to understand, system; records and information are still primarily paper-based; and researchers, administrators and policymakers often struggle to locate, interpret and validate the information they need to manage the system and enhance outcomes for consumers.

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<sup>4</sup> The Centre For Information Technology Leadership, Feb 2004

Achieving a connected health system across the thousands of health providers in existence today will be a considerable challenge – one made even more difficult and complex by our federal/state/private healthcare funding split and delivery system. Without a nationally collaborative approach in several important areas, efforts will be duplicated and incremental cost incurred. These important areas include common approaches to health privacy and identification, and the infrastructure and standards essential for system interoperability, as well as the establishment and management of electronic health records.

To add to the challenge, it is difficult to raise the awareness and capture the interest of ministers, Australian Government, state and territory Treasuries and other decision-makers to secure adequate levels of investment in health IM&ICT. It is also difficult to develop robust business cases for such investment, given diffuse benefits and long lead times for their realisation. A further hurdle arises in communicating complex IM&ICT issues in a way that engages key health stakeholders, some of whom may not be technologically 'literate'.

Ultimately, realising the benefits of health IM&ICT reforms will also depend on upgrading the IM&ICT capacity of our health workforce. This will involve developing skills across the continuum from basic computer and IT skills to specialist clinical information use, information management and health research/informatics expertise<sup>5</sup>.

## **2.2 Progress Made to Date**

In spite of these difficulties the last few years have seen significant work done and progress achieved in health IM&ICT, including reforms to governance arrangements. Exhibit 2.1 lists some key national health IM&ICT activities, primarily focussing on the activities between 1999 and 2003.

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<sup>5</sup> Report on the Health Information Workforce Capacity Think Tank (July 2003)

## ***Exhibit 2.1: Major National Health IM&ICT Activities, 1999-2003***

Year	Major National Health IM&ICT Activities
Pre 1999	<ul style="list-style-type: none"> <li>• Signing of the National Health Information Agreement (1993) and subsequent establishment of the National Health Information Infrastructure (incl. NHIMG)</li> <li>• Agreement of the National Health Information Development Plan (1995)</li> </ul>
1999	<ul style="list-style-type: none"> <li>• Health Online: A Health Information Action Plan for Australia first released</li> <li>• Health Insite public pilot site launched (1999); formal launch in April 2000</li> <li>• National Public Health Information Development Plan released</li> </ul>
2000	<ul style="list-style-type: none"> <li>• National Supply Chain Reform Task Force established</li> <li>• Health Ministers agree to jointly fund 2 years research and feasibility into HealthConnect (Nov)</li> <li>• National Health Privacy Working Group established</li> <li>• National Health Online Summit</li> </ul>
2001	<ul style="list-style-type: none"> <li>• National Health Data Dictionary and Management Process Review</li> <li>• Health e-Signature Authority established</li> <li>• General Practice Computing Group Informatics Work Program (01-04) released</li> <li>• Health Online (2<sup>nd</sup> edition) released</li> <li>• Expert Group on Health Classification established</li> <li>• Setting The Standards: A National Health Information Standards Plan For Australia</li> </ul>
2002	<ul style="list-style-type: none"> <li>• National Action Plan To Facilitate the Uptake of E-Commerce in Australian Hospital Supply Chains</li> <li>• HealthConnect Business Architecture released for comment</li> <li>• National Electronic Decision Support Taskforce established</li> <li>• Broadband Advisory Group announced</li> <li>• HealthConnect Trials Commence in NT and Tasmania</li> <li>• Australian Health Level 7 (HL7) Summit</li> </ul>
2003	<ul style="list-style-type: none"> <li>• Mediconnect field tests in Launceston and Ballarat announced</li> <li>• Draft Nation Health Privacy Code circulated for public consultation (Nov 2002-April 2003); currently before Health Ministers for consideration</li> <li>• HealthConnect Interim Research report and draft systems architecture released for comment</li> <li>• HealthConnect Project Review and Stakeholder feedback; planning for second phase</li> <li>• Draft Standards Plan released (Foundations for the Future: Priorities for Health Information Standardisation in Australia, 2004-2008)</li> <li>• New integrated health IM&amp;ICT governance arrangements announced leading to the establishment of the Australian Health Information Council (AHIC) and the National Health Information Group (NHIG).</li> </ul>

Some of the major milestones warrant further discussion:

- The signing of the National Health Information Agreement (NHIA) in 1993, as well as the subsequent formation of a group of national committees and plans/strategies, represents a landmark. As a result there is now consistent, timely and reliable information on a range of health issues and health services available for analysis, research and comparison at all levels of the healthcare system. Indeed, Australia is seen as a leader in many areas of health information management.
- The work of the Health Data Standards Committee (previously the National Health Data Committee) in the development and promotion of data standards for statistical purposes and, in particular, the creation of the National Health Data Dictionary (NHDD). The NHDD contains meta-data standards for several health sectors, including hospitals, drug/alcohol treatment and mental health, and clinical data standards for diabetes and cardiovascular disease.
- The development and release in 1999 of *Health Online: A Health Information Action Plan For Australia* by the National Health Information Management Advisory Council (NHIMAC) represented Australia's initial launch of a national strategic information action plan. The second edition of *Health Online* 2001 recognised the progress made and refined priorities going forward. In particular, it catalogued progress in achieving national collaboration; in laying sound foundations (privacy, security, standards, infrastructure, training to encourage technology uptake and best practice sharing); in empowering consumers and communities for better health management; in supporting clinical care; and in using information to build a more efficient and effective healthcare system.

- The HealthConnect concept developed from an agreement by Health Ministers in November 2000 to jointly fund a 2-year project to assess the value and feasibility of a longitudinal health record. A research report (published in April 2003) conservatively estimated the benefits of HealthConnect at around \$300m per annum based on a 10% reduction in adverse events<sup>6</sup>. In March 2004, the Australian Minister for Health and Ageing announced funding for the next phase of this project.
- Health IM&ICT governance arrangements evolved over this period with the formation of the National Health Information Management Advisory Council (NHIMAC) and the National Health Information Management Group (NHIMG), among many other national standing committees and working parties.
- A critical governance reform, however, was the streamlining of the national IM&ICT arrangements in late 2003. This led to the formation of the National Health Information Group (NHIG) and the Australian Health Information Council (AHIC) under the auspices of the Australian Health Ministers' Advisory Council (AHMAC) and the Australian Health Ministers' Conference (AHMC).

The aims of these reforms were to increase the effectiveness of IM&ICT spend, improve efficiency and ensure that IM&ICT fulfils its promise as a significant catalyst for reform. The more integrated approach to national planning and resourcing is designed to benefit all healthcare stakeholders, from consumers to clinicians, health researchers, administrators and policymakers, and to increase confidence in and accelerate the pace of national reform.

## 2.3 The Case for National Action

Health IM&ICT in Australia is at a critical juncture. Expectations for an electronically enabled healthcare system are high, but so is frustration about the pace of progress. A range of activities, some largely unconnected, is underway across the country. In this context, the importance of this strategic review was acknowledged in all our stakeholder interviews.

There is a strong case for focusing the national health IM&ICT agenda on a few critical areas, and for doing so in the near rather than the longer term. National co-ordination is required to deliver the fundamental IM&ICT building blocks required to support a move towards greater system interoperability.

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<sup>6</sup> HealthConnect Program Office, HealthConnect Interim Research Report vol 2. What will HealthConnect cost and is it sustainable?, April 2003

Several other countries are approaching health IM&ICT prioritisation and coordination on a national, cross-jurisdictional basis. For example, in 2001 Canada established a new authority, Infoway, with a charter to accelerate the development and adoption of electronic health records. Similarly the UK's National Programme for IT is tasked with creating a multi-billion pound information infrastructure to meet the National Health Service's (NHS's) needs now and into the future.

Australia's federal political structure and split funding arrangements for health make IM&ICT a crucial enabler of coordination between healthcare stakeholders. Most documents that describe the future of the health system, such as Queensland's 2020 Vision, argue that a better connected health network will be critical to meeting future challenges in a cost-effective way.

There is a strong case for moving decisively now. After years of under-investment, the states are beginning to invest significantly in new clinical information systems (CIS), patient administration systems (PAS) and electronic health records (EHR) within their hospital networks, as their existing systems reach the end of their useful lives. Investment of over \$350 million is projected for these systems over the next 2 years, with many projects now in the planning stage<sup>7</sup>.

If these projects are implemented using common standards, there is real potential to enhance connectivity across the whole health system. If the opportunity is missed, the nation will face another 'rail gauge' problem. As experience in banking and other sectors shows, heavy costs are incurred when systems need to be changed later to ensure interoperability.

This review found a clear need for national action in coordinating health IM&ICT investment and activity in some important areas. In the following section, we describe the scope of the review and the approach adopted to its completion, followed in later sections by our findings, recommendations and suggestions for next steps.

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<sup>7</sup> Estimated spend from BCG Health IM&ICT project portfolio review

## 3 Review Scope and Approach

### 3.1 Scope

This review is a first step in the development of an overarching national strategy for health IM&ICT. Given the 7-week timeframe, we directed our efforts towards providing high-level direction and narrowing the focus for future national work in this area, as shown in Exhibit 3.1.

***Exhibit 3.1: Review Scope***

In Scope	Out of Scope
An assessment of current initiatives and priorities for Health IM&ICT to feed into a broader IT strategy	Development of a complete 'IM & ICT strategy' for the Health Sector
Identification of Health IM&ICT initiatives underway or planned to deliver new capabilities	'Business-as-usual' operational IM&ICT activities
Activities required to manage, store or transmit electronic data in the Healthcare system	Specific initiatives to generate new health research data (e.g. clinical trials)
Identification of stakeholder national IM&ICT priorities, and comparison of these with observed activity to identify: <ul style="list-style-type: none"><li>• Gaps</li><li>• Overlaps and duplication</li></ul>	Commentary on the internal locality-specific priorities of individual jurisdictions
Proposal of specific activities that need national coordination going forward	Recommendations regarding IM&ICT activities that specific states should be undertaking
Identification of dependencies & recommended sequencing and timing of initiatives	Assessment of the delivery effectiveness of current initiatives, or the project management capabilities of the respective jurisdictions
Recommendations regarding changes to governance of national health IM&ICT initiatives	Detailed recommendations of the funding required to support national health IM&ICT initiatives

### 3.2 Approach

Three fundamental questions governed our approach:

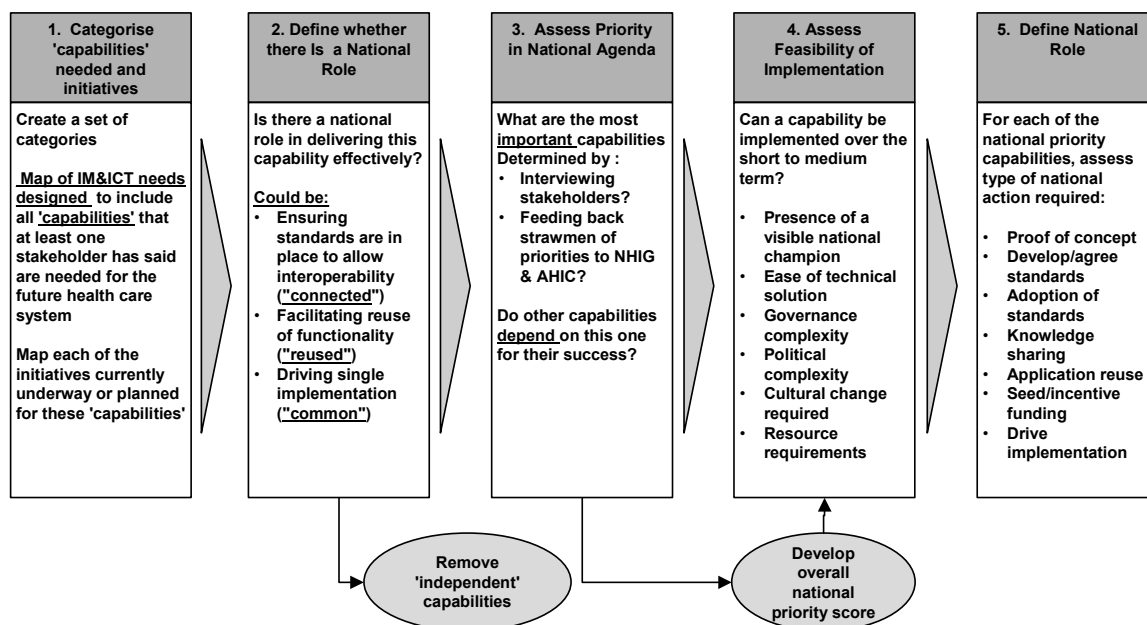
- What health IM&ICT activities are currently in progress?
- What are the priorities for national involvement in health IM&ICT?; and
- How can these national priorities best be pursued?

To answer the first question, we compiled a database showing the nature and status of the major, publicly funded health IM&ICT activities being undertaken or planned by all Australian jurisdictions. Private sector health IM&ICT investment, although significant in areas such as radiology, pathology and the private hospital sector, was not included in this review because of commercial sensitivity issues.



Our approach to identifying the priorities for national involvement in health IM&ICT is outlined in Exhibit 3.2. This relies heavily on the interviews we conducted with stakeholders to explore their needs and requirements for national health IM&ICT capability development.

***Exhibit 3.2: Steps Taken to Assess National Health IM&ICT Priorities and Role***

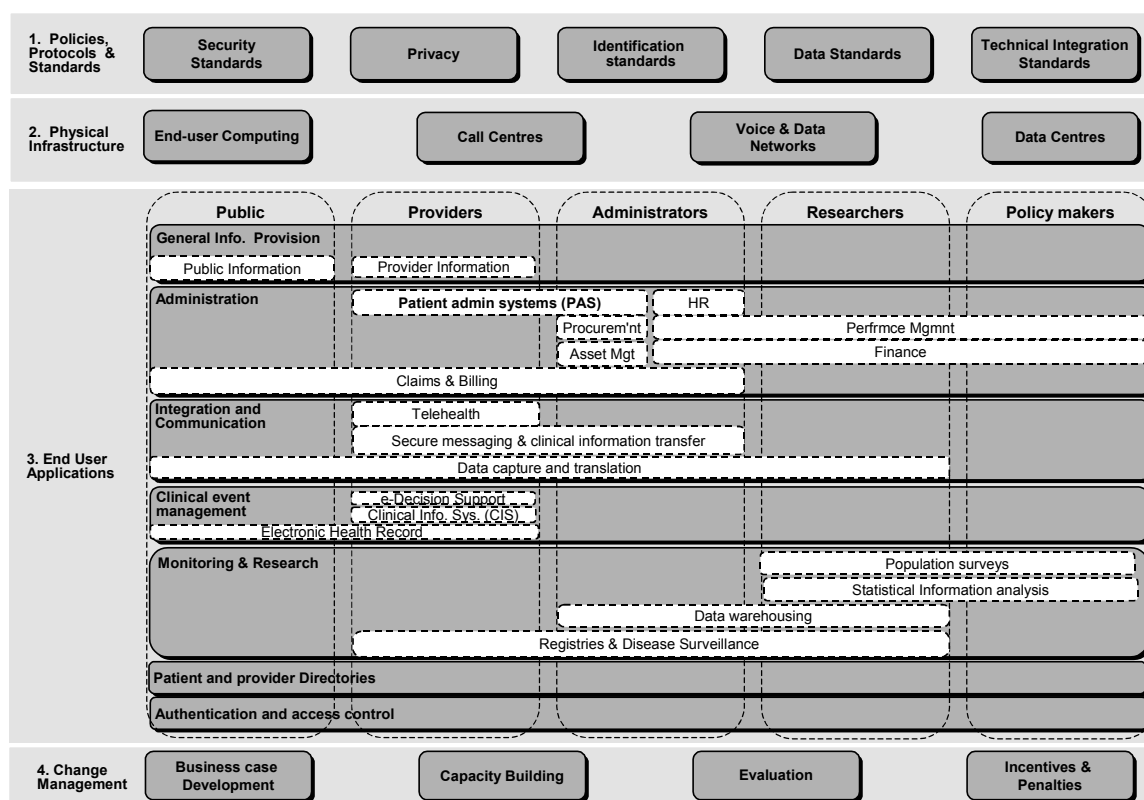


***3.2.1 Step 1: Categorise Capabilities Required***

Appropriately designed information technology enables the right information to be delivered to the right decision makers at the right time. Without the information itself, benefits cannot be realised. However, a set of human and technological capabilities is needed to acquire, process, manage and distribute this information. To categorise the capabilities required in the healthcare area, we created, and then consulted with stakeholders to refine, a picture of all the components of health IM&ICT. We then developed a framework that logically arrays the 35 required capabilities into four major groupings (Exhibit 3.3).

We used this framework throughout the review to describe the array of initiatives currently underway, stakeholder priorities and recommendations for future focus. Definitions of each of the capabilities are contained in Appendix 1.2.

### Exhibit 3.3: Health IM&ICT Capabilities



Public sector departments, agencies and organizations throughout Australia mapped onto this framework the health IM&ICT initiatives in which they are involved.<sup>8</sup> The project team ensured that the information was comprehensive and comparable by remapping initiatives where specific capabilities had been defined differently by respondents, or where definitions had been changed during the collection process.

A total of 363 projects from 21 different jurisdictions and agencies were identified and mapped to at least one of the capabilities. In addition, the project team collected brief initiative descriptions and information on initiative budgets. (The data collection template is shown in Appendix 1.4 and a summary description of all the individual health IM&ICT projects is included in Appendix 1.8)

<sup>8</sup> Although some private sector projects were identified, they were not captured in any comprehensive way. The funding and provision of such projects is fragmented, and commercial issues limit the type and level of information that can be released.

### 3.2.2 Step 2: The National Role

Many capabilities, while important at the state or local level, do not warrant national collaboration or action. Individually they may be high priority areas, but they are best advanced independently.

Three categories of capabilities ('common', 'reused' and 'connected') were identified as needing national involvement and coordination (Exhibit 3.4).

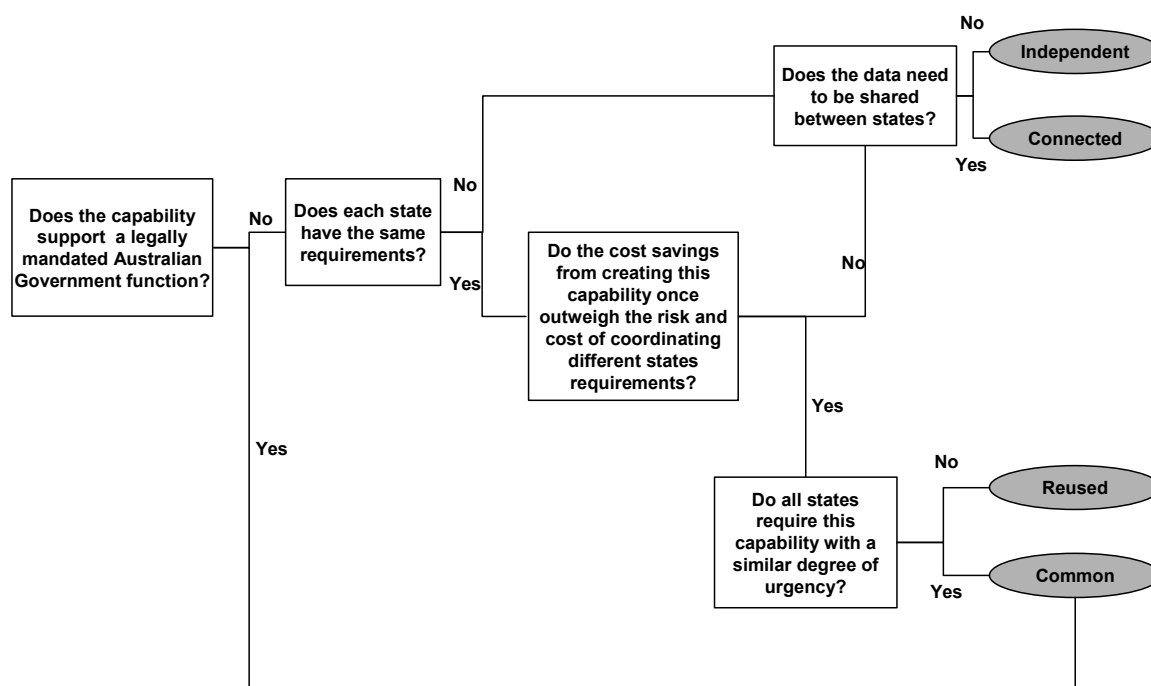
**Exhibit 3.4: Categories Requiring National Involvement**

Approaches To Deliver IM&ICT Capabilities	Definition Of Approaches	Imperative For National Collaboration	National Role
<b>Common</b>	<i>Single</i> solution nationally; implemented <i>once</i> and used by <i>all</i> states	✓ ✓ ✓	National body implements once; Central budget under joint governance spent once for the benefit of all jurisdictions
<b>Reused</b>	<i>Single base</i> solution will meet most requirements nationally; implemented in <i>one state/region first</i> and <i>adopted</i> opportunistically by <i>others</i> later, if needed	✓ ✓	National body identifies, disseminates and coordinates the reuse of functionality across jurisdictions
<b>Connected</b>	Single set of standards but <i>multiple</i> solutions nationally; solutions connected to each other to ensure information flow	✓ ✓	National body agrees, endorses and encourages adoption of standards and ensures their maintenance on an ongoing basis
<b>Independent</b>	<i>Multiple solutions across jurisdictions</i> ; ease of stand-alone implementation outweighs benefits of co-ordinated development	✗	None

 National Co-ordination Valuable

To identify the appropriate level of national involvement for each capability, the project team used a decision tree that has been validated in a number of similar exercises (Exhibit 3.5).

**Exhibit 3.5: Decision Tree to Determine Appropriate Level of National Involvement**



For example, in applying the decision tree to the patient administration systems (PAS) capability the following conclusions were drawn:

- The PAS capability is clearly within individual state and territory accountabilities;
- Not all hospitals have the same requirements for PAS systems. Requirements vary dramatically by type and sophistication of institution;
- At present some of the data in PAS needs to be shared in aggregate form across jurisdictions. This need will only increase as we move towards electronic health records; and
- The PAS capability should be viewed as 'connected' – that is, there may be multiple types of PAS in use across Australia but they need to connect to ensure information flows.

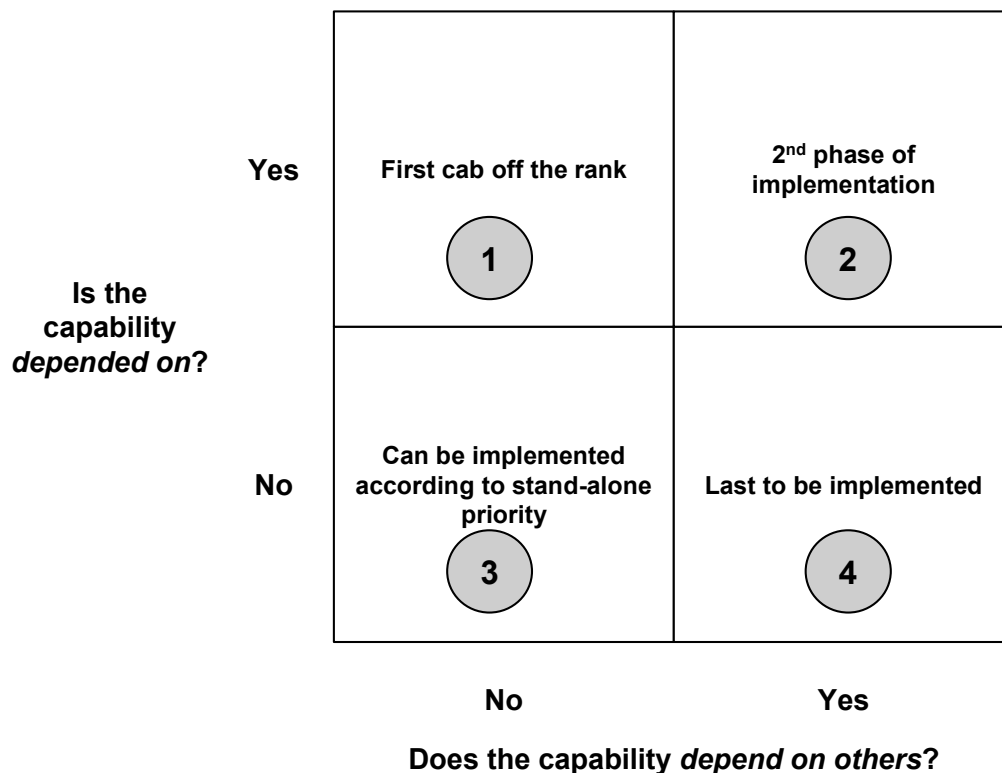
In addition, the national role could be expanded to include the promulgation of best practice models or frameworks across jurisdictions. For example, developing a more standardised approach to evaluation methodologies could enable more accurate benchmarking of project and system outcomes.

### 3.2.3 Step 3: Assessing Priorities

In this step, we interviewed close to 50 key stakeholders in health IM&ICT. (The full list of interviewees is provided in Appendix 1.6) Although each interview focused on areas specific to the interviewee's role, all were asked for their views on the highest priority national IM&ICT capabilities.

We also sought to identify, both from interviews and from IM&ICT initiative documentation, the interdependencies amongst capabilities. Each capability was assessed as being in one of four positions on a dependency matrix, as outlined in Exhibit 3.6.

**Exhibit 3.6: Classification of Capability Dependencies**



**n** Dependency driven order of implementation

The capability dependency matrix is best illustrated by working through a couple of examples. For example, let's consider EHR. Several key building blocks, such as interconnecting hospital/primary care systems and data and identification standards, need to be in place before EHR can become a reality. As no other required capability depends on EHR development, it falls into quadrant 4 – it is a capability that can be implemented on a standalone priority basis.

The reverse is true of data and voice networks, and investment in broadband access. Without broadband infrastructure in place, large parts of rural Australia will have no or limited access to online services or the other potential benefits of EHR. Installing broadband is therefore critical to the development of other capabilities. As broadband itself doesn't depend on other capabilities, it falls into quadrant 1 (a 'first cab off the rank capability').

### **3.2.4 Step 4: Feasibility of Implementation**

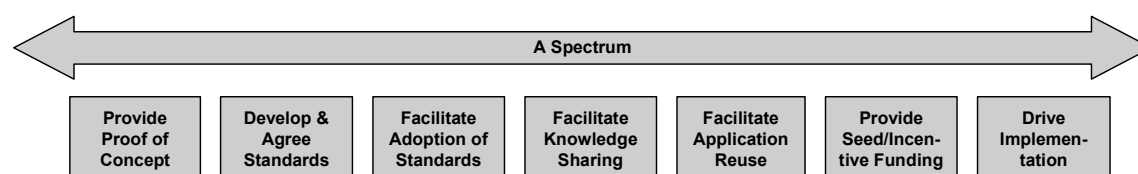
In the final step, we assessed the feasibility of implementing the required capabilities in the short to medium term. Based on interview data and international literature on technical feasibility, each capability was assessed against six criteria. Using a simple 3-point scale, the team rated each capability as more, less, or equal to the average for all capabilities on each of the following dimensions:

- Presence of a visible national champion
- Ease of technical solution
- Governance complexity
- Political complexity
- Cultural change required
- Approximate resource requirements

### **3.2.5 Step 5: Defining The National Role**

Having identified the Health IM&ICT priorities requiring national co-ordination, further work was undertaken with stakeholders and other experts to define the nature of the national role for each priority capability. These fall across a spectrum as illustrated in Exhibit 3.7 below.

**Exhibit 3.7: Comparison of Potential National Roles**



## 4 Findings

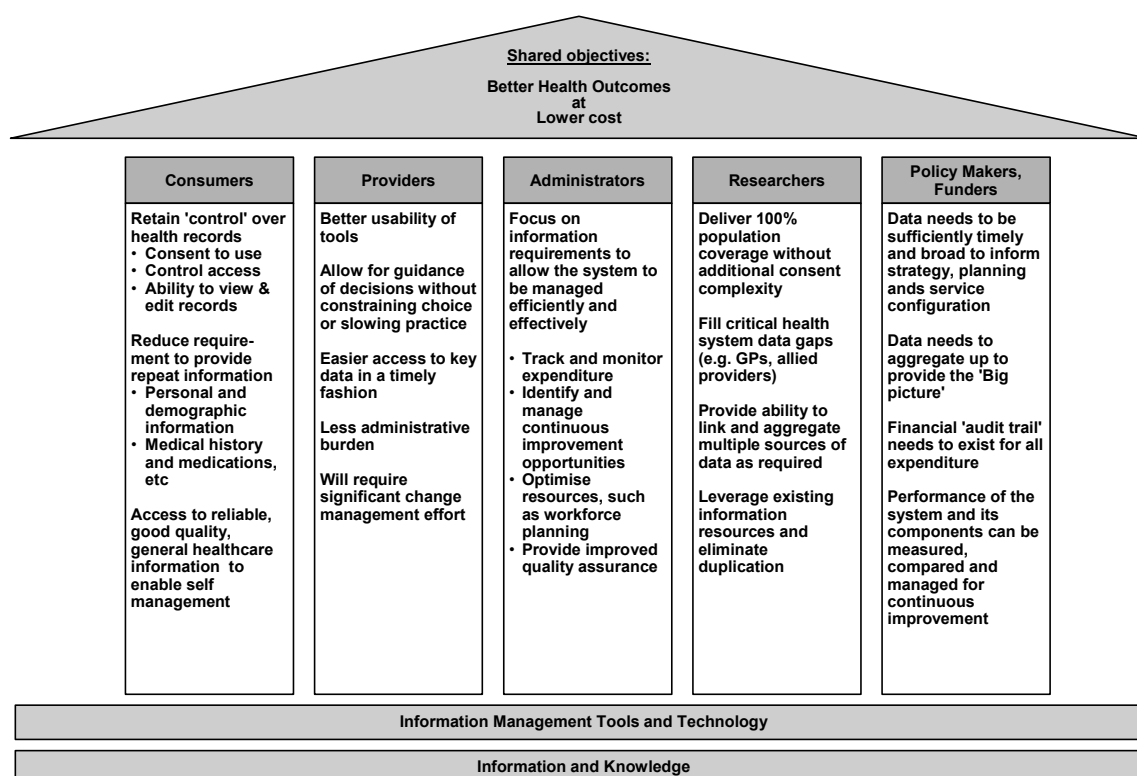
Our findings are discussed under the following headings:

- Stakeholder requirements
- Current health IM&ICT project landscape
- National priorities
- Other initiatives
- Obstacles/challenges to progress

### 4.1 Stakeholder Requirements

There is widespread consensus that the underlying rationale for IM&ICT-driven health reform is to improve health outcomes for Australians while containing health system costs. However, while sharing this overarching objective, different stakeholder groups are pursuing a range of different outcomes. Exhibit 4.1 shows the specific outcomes sought by five key stakeholder groups through the application of information management tools and technology as well as information and knowledge.

***Exhibit 4.1: Stakeholder Objectives for IM&ICT***



For *consumers*, an appropriate IM&ICT solution is likely to be one that delivers better and safer outcomes (less potential for adverse events and improved diagnosis, treatment and prognosis) as well as providing health record 'ownership'. Such a solution will empower them in relation to consent; enable them to control providers' access to their records; and provide them with the ability to access and edit their records. It will also enhance convenience and enable seamless transfer as consumers navigate different providers and components of the healthcare system. No longer will they have to repeat information as they move between doctors, nor will they have to remember all their prescription medications. In addition, consumers will have easy access to reliable, up-to-date general medical information to better understand their diagnoses and inform their treatment choices. For individuals in rural and remote areas in particular, online services will become an increasingly important way of accessing quality health services.<sup>9</sup>

For *providers*, especially clinicians, an appropriate IM&ICT solution is likely to be one that provides timely and accurate information to improve patient outcomes. It will streamline their day-to-day work rather than becoming an incremental burden. Better histories and decision support will result in better decisions and fewer errors and safety concerns. However, where the benefits of using new systems largely accrue elsewhere in the system, and their use imposes an additional cost or burden on providers, direct incentives may be required to induce providers to use systems that produce wider benefits.

For *healthcare administrators*, an appropriate IM&ICT solution is likely to be one that offers enhanced efficiency and effectiveness in managing the health system. This includes improved ability to track and monitor expenditure, to fund interventions that are shown to be effective, to identify and manage continuous improvement opportunities, to optimise resources (particularly workforce planning) and to provide quality assurance.

For *health researchers*, an appropriate IM&ICT solution is likely to be one that provides better linkages between clinical, health system and population data to inform understanding of disease patterns, the effectiveness of interventions and service deployment, utilisation and efficiency, as well as policy development and resource planning.

In addition, health researchers require an IM&ICT solution that provides 100% population coverage (or at least for a representative sample), and data that has been de-identified to avoid added complexity in meeting specific consent requirements. Greater depth and accuracy of information may be desirable, but not if it compromises information representativeness. The solution should also make effective use of existing information resources through effective data linkages and eliminate duplication in data collection.

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<sup>9</sup> It should be acknowledged, however, that not all members of the community are comfortable with the 'information age', and some will continue to prefer traditional methods of accessing health information.



One research requirement that transcends the needs of all stakeholders is 'fit for purpose' data. This is data at the appropriate level of detail, anonymity, aggregation, linkage and supplementation to meet a particular stakeholder's use (see Exhibit 4.2). The protection of individual privacy is, of course, paramount across the spectrum.

***Exhibit 4.2: Key Health Stakeholders' Data Requirements***

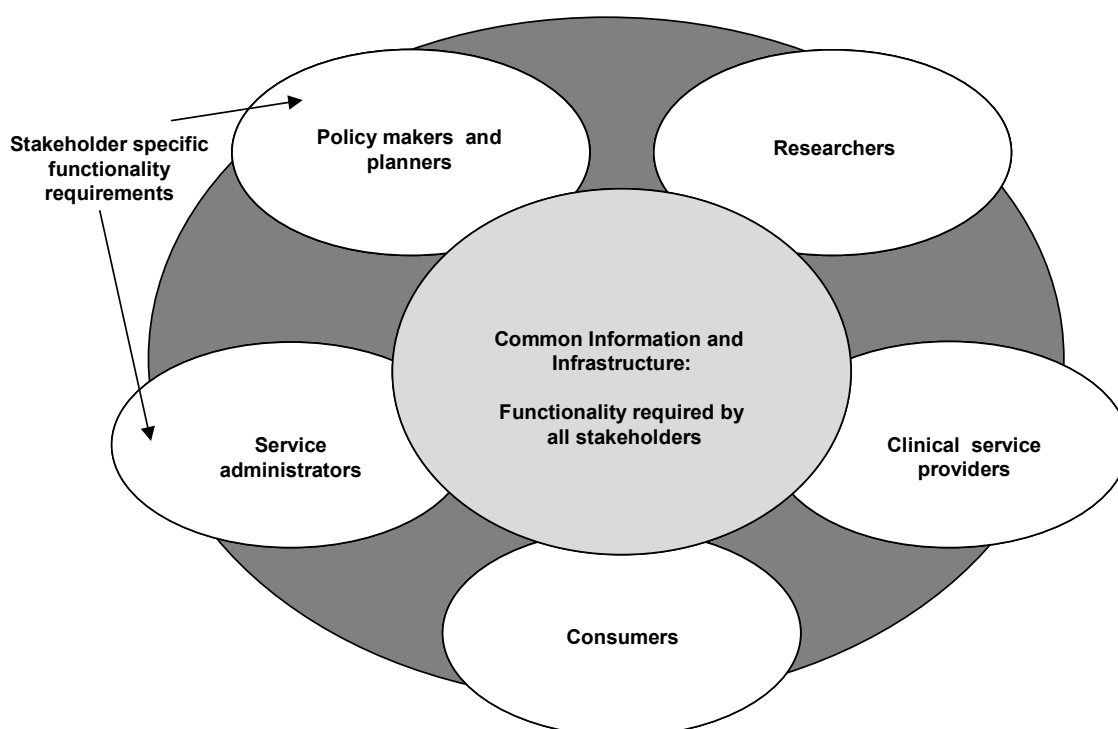
Key Health Stakeholders		Data Imperatives	Example Types Of Data
Researchers	Policy Makers	Data 'fit for purpose' • Detail Level • Anonymity • Aggregation • Linkages • Supplementation from other sources	Performance Monitoring
	Administrators		Surveys
	Providers		Research Data
	Patients		Registries & Screening
			Administrative Data
			Case Series
			Case Studies
			Patient Record

Linkages between current data collections will greatly assist research into health system performance and outcomes, and in the medium to longer term will cost-effectively inform effective treatment interventions, prevention and other public health initiatives.

For *policymakers* and *governments*, an appropriate IM&ICT solution is likely to be one that provides information that is both timely and broad enough to inform their strategy, planning and service configuration needs. The data must be comprehensive and complete to provide an overall system perspective, while providing an adequate audit trail for expenditure and of sufficient detail for quality assurance purposes. It should enable resources to be focused on the areas of highest priority, and provide the ability to track health outcomes and identify continuous improvement opportunities, as well as change policy and funding as required.

Some of these stakeholder imperatives require purpose-built information technology with specific functionality. However, some infrastructure components are likely to be common across the range of stakeholders and will have to be designed with the needs of multiple users in mind. (Exhibit 4.3).

### ***Exhibit 4.3: Common & Stakeholder-specific IM&ICT Requirements***



For example, information on the diagnosis underlying a hospital admission is likely to be of interest to multiple stakeholders – to clinicians in making decisions on patient management, to hospital administrators working out the Diagnosis Related Group (DRG) for which the hospital will be reimbursed, to researchers studying the incidence of the patient’s disease or condition, to policymakers wanting to understand whether the overall impact of the disease or condition warrants a preventative programme, and to the patient, who might want a better understanding of the need for hospital admission.

While a single diagnosis code and/or description (common diagnostic information) could be adequate for administrators, policymakers and the patient, clinicians will require additional detail on the presenting symptoms, physical findings, investigation results and patients’ likely responses to treatment. Researchers may want to link the clinical information to information on the patient’s occupation or area of residence to assess potential causal links. Other points of difference for stakeholders may relate to information accuracy and timeliness. Clinicians, for example, are likely to require highly accurate information in near real time, while researchers may be happy to accept information long after the fact and with moderate error rates, so long as these are not systematic.

## 4.2 Current IM&ICT Project Landscape

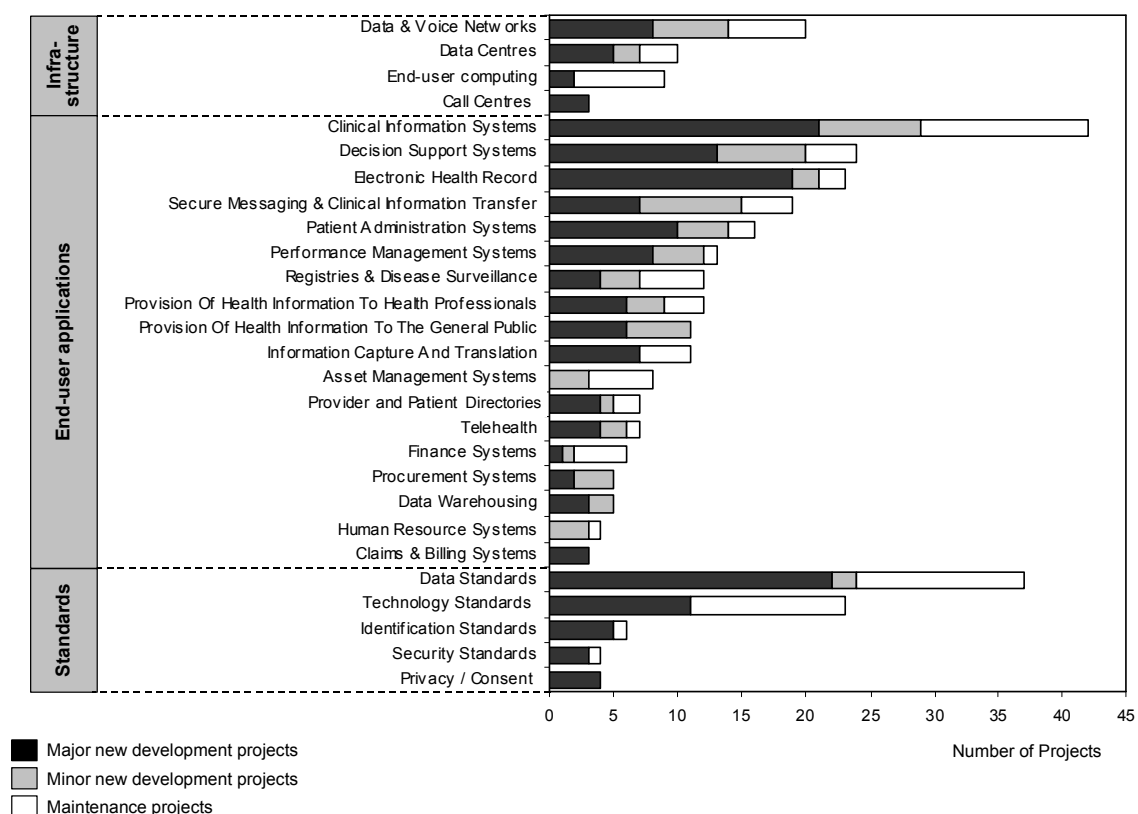
The review identified over 360 current or planned health IM&ICT initiatives across all jurisdictions in both the public and academic sectors. A full list of the major new development projects and their key features is provided in Appendix 1.8.

Examination of the portfolio of projects reveals some key themes, particularly in the areas of project mix, volume and size, as well as expenditure and business case development.

### 4.2.1 Project Mix, Volume and Size

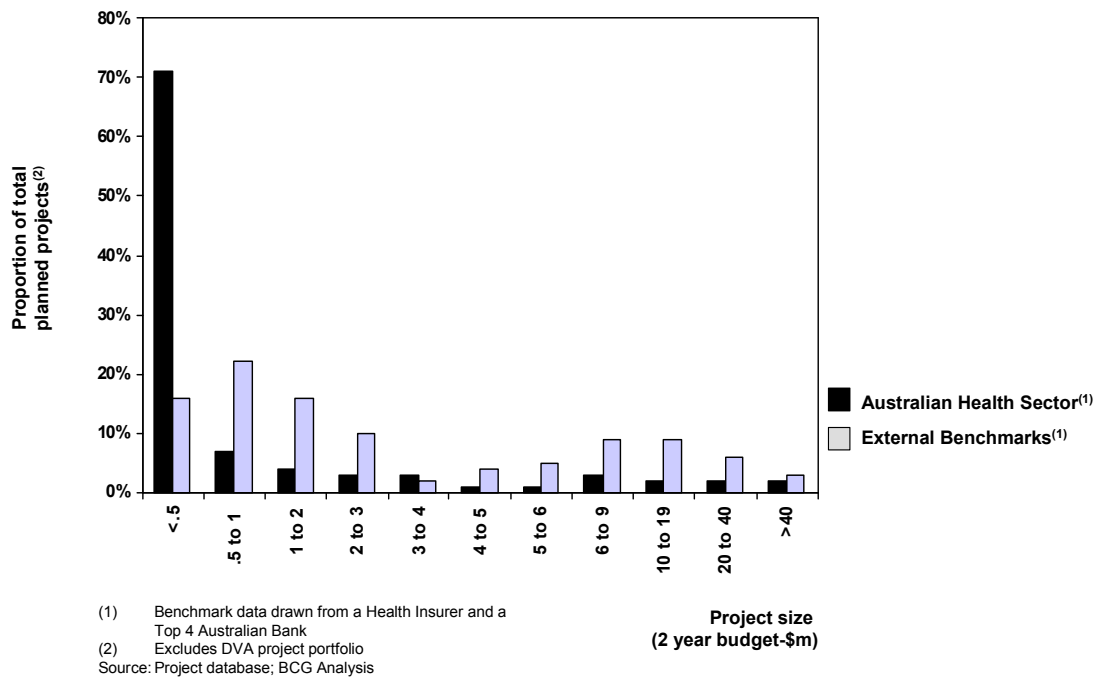
Exhibit 4.4 summarises all current reported IM&ICT activities by capability and project type (major development, minor development or maintenance).

**Exhibit 4.4: Total Projects by Capability and Type of Project<sup>(1)</sup>**



Perhaps the most striking feature of the large number of planned projects is their small average size. Exhibit 4.5 shows the sizes of the projects against benchmark IT project data from two industries that collect and manage large volumes of data. Around 70% of the health IM&ICT initiatives we identified as having a total budget of less than \$0.5 million, compared to less than 20% in our benchmark data.

### Exhibit 4.5: Health IM&ICT Initiative Size Versus Benchmarks



While there has been significant improvement in strategically aligning IM&ICT priorities over the past 5 years, there remains a variety of activity, some largely independent, in progress. This is consistent with feedback from stakeholders about the non-strategic allocation of funds across jurisdictions – what has been described to us as the ‘letting many flowers bloom’ approach. In addition, other activities are underway building innovative but often incompatible or unconnected systems.

This approach carries some risk. Many initiatives may be too small to deliver the desired outcomes. Some stakeholders believe they are overburdened with multiple initiatives, and they do not have a clear picture of the outcome to which they are contributing.

The surprisingly large number of projects in areas such as Patient and Provider Directories suggests that stakeholders are trying to meet their immediate needs in the absence of a national solution. This is consistent with the frustration that many stakeholders have expressed about a perceived lack of progress in these areas and the increasingly urgent need for solutions.

In some areas there appears to be genuine duplication across jurisdictions of an activity that would be more efficiently and effectively performed at a national level. For example, there are 13 projects underway in the area of patient and provider identification. A single national effort could yield substantial savings upfront and would avoid the need for significant investment later to combine the databases.

Although desirable, there are external barriers that make such a common implementation complex.

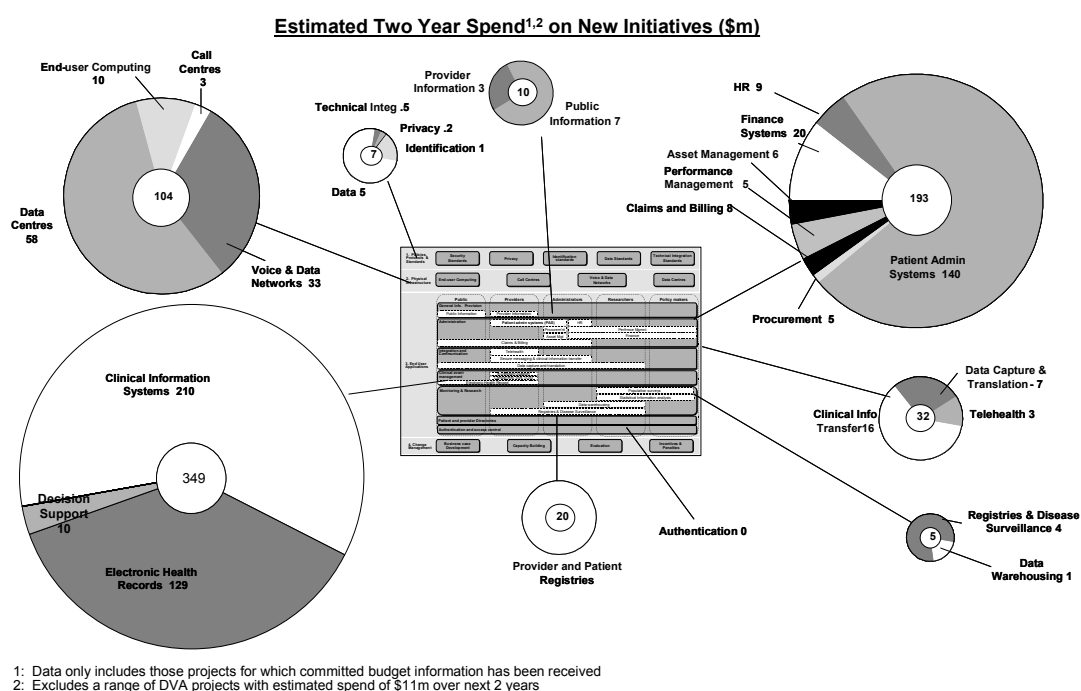
In other areas, such as data standards, the various initiatives do not appear to overlap but they might be more efficiently executed if they involved fewer, high priority areas at any time, and if shorter delivery timeframes were expected. In addition, some stakeholders are concerned that inadequate resources are available to extend standards work beyond the traditional statistical areas and that there is a need to develop a more co-ordinated approach to managing the various demands and priorities for standards development. Resources to complete the work between meetings are also limited in some areas, and there is no authoritative body to endorse and implement standards on completion.

Provider information provision is another area where many projects are in train. Twelve initiatives are underway to provide online knowledge management, clinical guidelines, training and library services to providers. Combining these under a single Australia-wide portal for professional information is likely to produce better results than the current state or regional approach. Although adopting a co-ordinated approach in this area appears to offer clear benefits, stakeholders did not identify it as a high priority for the immediate national agenda.

#### ***4.2.2 Project Expenditure***

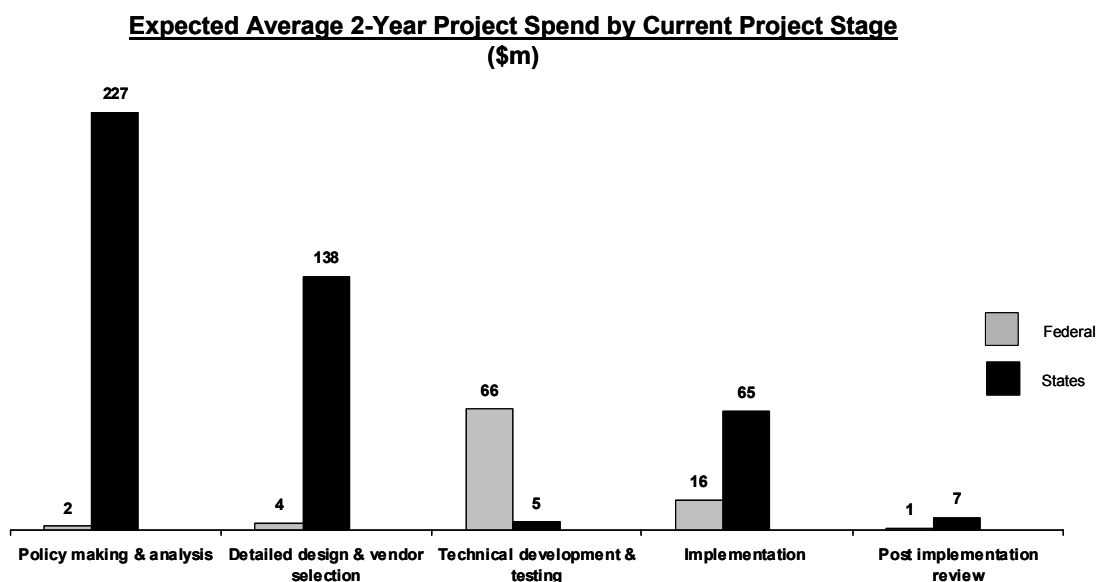
Three areas dominate project expenditure – clinical information systems (CIS), patient administration systems (PAS) and electronic health records (EHR) (Exhibit 4.6). This figure excludes significant investment in health IM&ICT from the private sector.

## Exhibit 4.6: Projected Spending by Capability



The bulk of new project spend at the state level is directed towards CIS and PAS. Most of these projects are early in their lifecycle, so the adoption of new standards and architectures is likely to be possible (Exhibit 4.7).

## Exhibit 4.7: Planned IM&ICT Investment by Current Initiative Stage



- (1) Includes 85 IM&ICT projects developing end-user applications for which stage information project budgets have been provided  
(2) Source: Project Database, BCG Analysis

PAS and CIS implementation will create the foundation for future EHR. They warrant significant effort now to ensure they are aligned. Standardising these initiatives is likely to contribute more to long-term EHR achievement than dedicated health records pilots or evaluatory research. The converse – failure to adopt standards – will create a significant obstacle to interoperability for the next 5 to 10 years.

Relatively little investment (\$7m over 2 years) has been allocated to standards development. While this may in part reflect the incorporation of standards funding into larger system implementation projects, the importance of standards development warrants investment levels similar to those observed overseas. In the UK and Canada, for example, over A\$50m/year is committed to standards development.

More importantly, significant investment is likely to be needed to ensure the adoption and implementation of standards through software accreditation, incentives, training and change management. Such considerations do not appear to have been factored into existing project implementation budgets.

In some industries, such as banking, organizations have not adopted a rigorous end-to-end approach to information standards, mainly because their technology was built before modern enterprise information architectures had been conceived. These organizations now face significant investment to resolve data maintenance and interoperability problems. We are familiar with one major bank that allowed its divisions to develop, in parallel, three separate standards for customer identification. This bank is facing an investment of \$100m to align its customer registries and provide a single, comprehensive customer view. Given the wave of new systems implementation projects planned by the states, the opportunity to avoid this extra expense by standardising health IM&ICT should not be lost.

#### **4.2.3 The Business Case Challenge**

The difficulties of developing health IM&ICT business cases were evident from the project review. Under half of the reported initiatives have a scoped business case, and only a handful of those identified the quantifiable financial, clinical or outcomes-based benefits to be achieved within a certain timeframe.

Stakeholders repeatedly raised this issue as a major obstacle to progress. Their view is that the longer term, more diffuse and less visible payback from health IM&ICT investment, relative to other initiatives, has contributed to its relative under-funding. For example, investment in human services ICT is around 11% under the investment in some other sectors.<sup>10</sup>

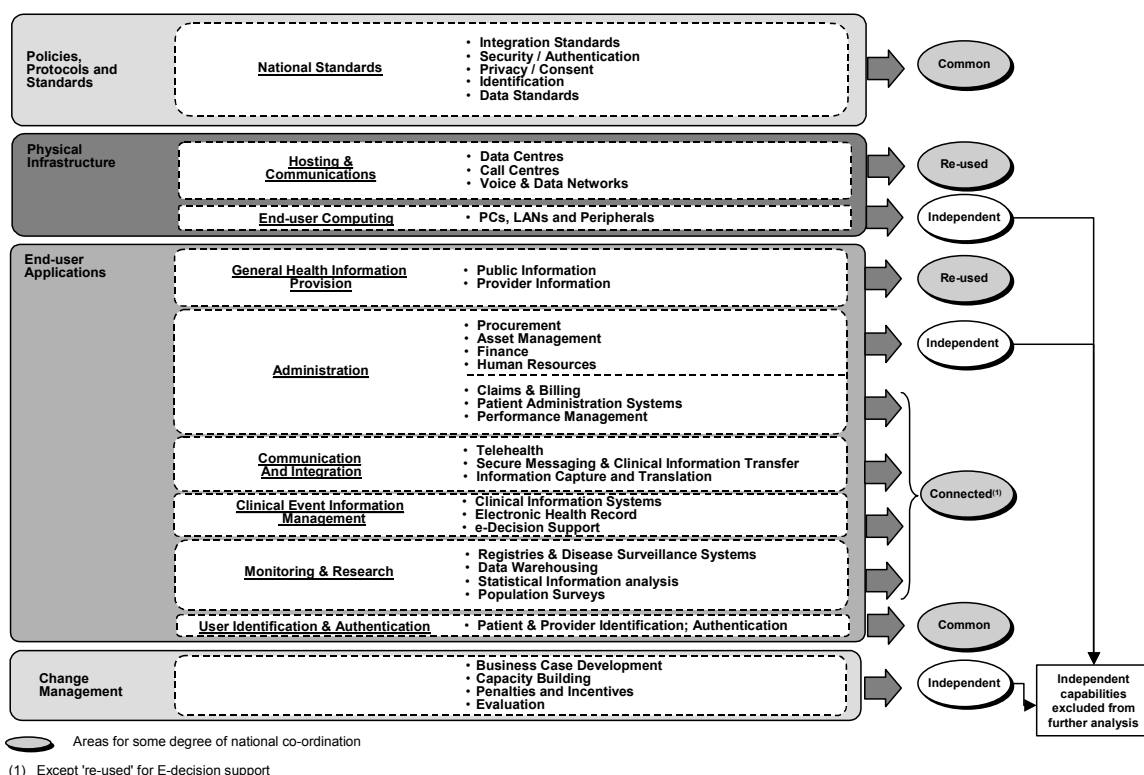
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<sup>10</sup> Victorian Whole of Health Information and Communication Technology Strategic Plan 2003 – 2007

### 4.3 National Priorities

Our first step here was to identify the possible scope of a national role in delivering required health IM&ICT capabilities (Exhibit 4.8). While most would appear to benefit from some national role, relatively few (and predominantly those in the areas of standards, common methodologies and best practice models) warrant a common implementation approach. 'Independent capabilities' were excluded from the subsequent dependency and feasibility assessment.

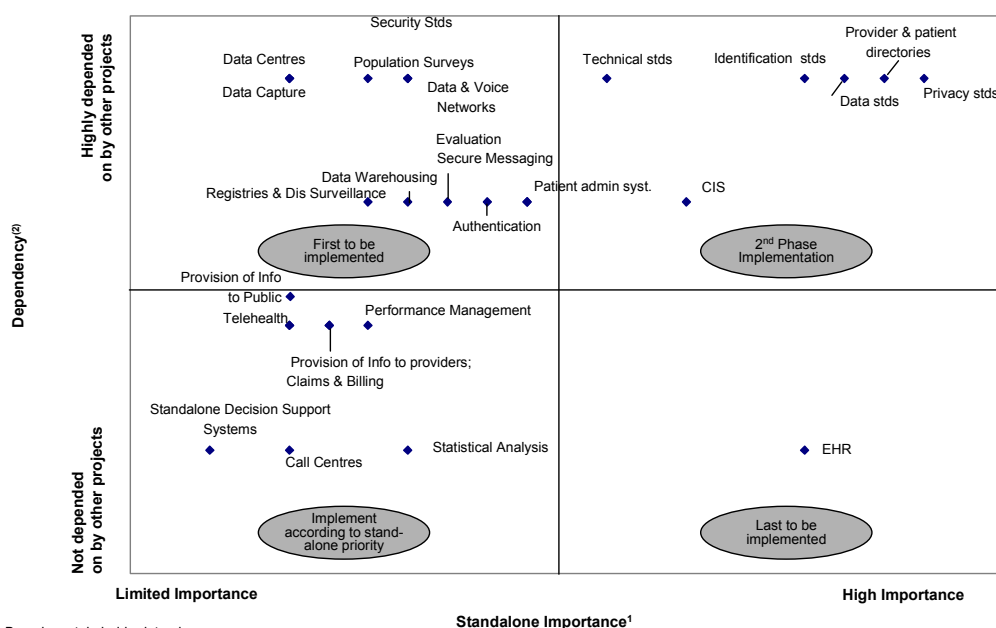
**Exhibit 4.8 National Roles in Capability Implementation**



Stakeholder priorities and interdependencies between capabilities were then assessed to determine short and medium term priorities (Exhibit 4.9).



## Exhibit 4.9 Standalone Priority & Interdependency for Capabilities Requiring National Involvement

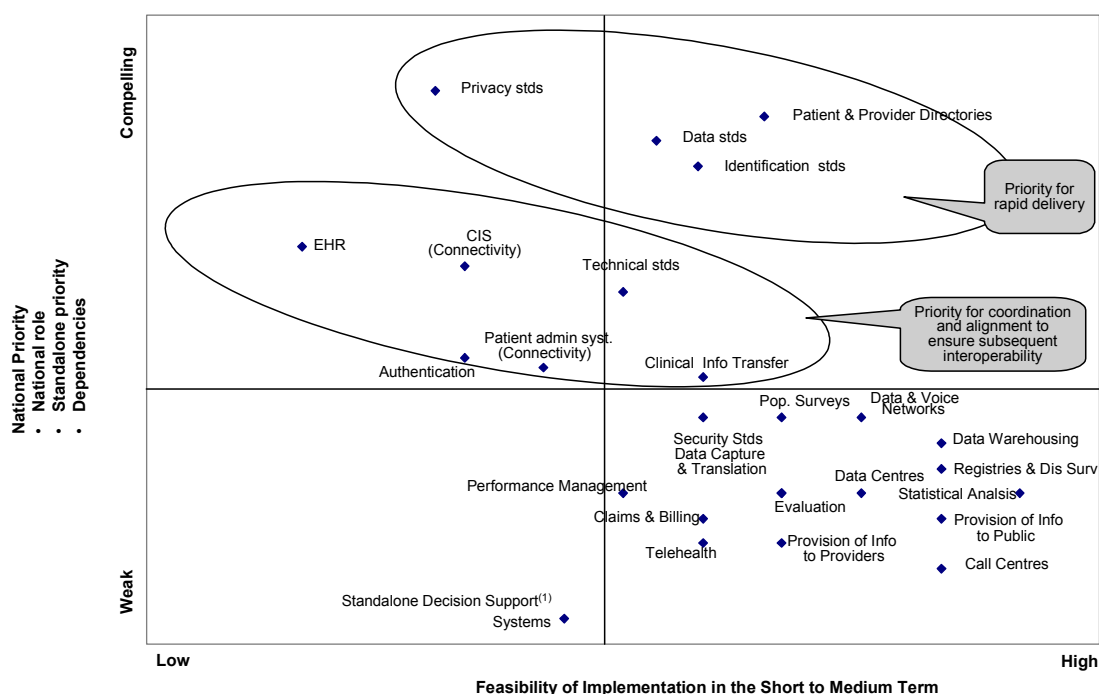


(1) Based on stakeholder interviews

(2) Based on Health Connect draft systems architecture; Team technical analysis

Finally, information on the feasibility of implementation provided a view of the overall priorities for national involvement (Exhibit 4.10).

## Exhibit 4.10: National IM&ICT Priorities



(1) Although there was little support for stand-alone Electronic Decision Support, a number of respondents felt its inclusion within clinical information or secure messaging systems and the issues around knowledge accreditation were of national importance

Source: Stakeholder Interviews; NHIG/AHIC committee input; BCG Analysis

A common approach – especially in privacy, health data standards and patient and provider identification and directories – should clearly be regarded as immediate priorities for national action.

The development and implementation of a common health privacy framework is seen as a difficult area, but the challenges are primarily in the political and governance areas. This suggests that with a strong champion, coupled with willingness to openly debate the issues and strike the right compromises, significant progress is possible.

A further set of high priority, but typically less easy to implement capabilities, presents opportunities for ensuring sound foundations and interoperability. These are the areas of major planned investment (CIS, PAS, and EHR) and include some potentially ‘quick win’ areas such as clinical information transfer/order entry. Some of the potentially more difficult technical requirements, such as authentication and technical integration standards, also fit into this category

In addition, research stakeholders repeatedly mentioned the importance of health IM&ICT to their work. There is growing interest in the use of linking data from the Medical Benefits Scheme (MBS), Pharmaceuticals Benefits Scheme (PBS), hospital and other data collections for the purpose of epidemiological, economic and health science research. A number of cross-jurisdictional projects are underway as well as development of a protocol for the protection of privacy. The appeal of these data sets is that as national infrastructure is already in place, the marginal cost for extending the use of current collections is very small.

The top priorities align fairly well with the level of planned project expenditure, with the exception of standards development. Looking at Australia’s top priorities and planned funding levels compared with those in the UK and Canada, several conclusions can be drawn:

- While Australian stakeholders agree that standards development is a high priority area, planned investment does not reflect this. In addition, the substantial costs associated with ensuring the adoption of standards, their consistent rollout and ongoing maintenance have not been factored into project profiles or funding arrangements.

This misalignment in Australia is reinforced when compared with the approaches adopted by the UK and Canada. The Canada Health Infoway plans emphasise standards development and adoption. Infoway has committed between C\$190m and C\$240m (approximately 20% of its budget) to the development of architecture and standards over 4 years<sup>11</sup>. The UK NHS Information Authority, which is tasked with coordinating national investment in an arguably less complex environment, has an annual budget of approximately A\$240m - \$55m of which is committed to setting and agreeing standards, service support and health informatics development<sup>12</sup>.

- Investment in CIS, PAS and EHR appears to be in line with identified priorities, and is broadly comparable to the Canadian and UK approaches. Differences here appear to be primarily due to differing jurisdictional responsibilities for these areas, rather than a different set of priorities.
- Planned investment in provider and patient identification and directories appears to be in line with Australian and overseas priorities.
- In the areas of clinical information transfer and secure messaging, there appears to be a mismatch between their importance and their funding. Many projects are underway across Australia, but they are small-scale and tactically rather than strategically focused.
- It is difficult to reach a conclusion about authentication and access control. These are recognised as critical capabilities in achieving desired privacy and consent outcomes, but funding the technical requirements does not appear to have been a priority here or overseas

#### **4.4 Other Initiatives**

Some stakeholders have expressed surprise at the relatively low priority accorded to particular capabilities. Two in particular warrant further discussion – electronic decision support (EDS) and broadband rollout.

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<sup>11</sup> Canada Health Infoway, Building Momentum – 2003/04 Business Plan

<sup>12</sup> NHS (National Programme for IT), Making IT Happen (2003)

#### 4.4.1 *Electronic Decision Support*

The November 2002 report of the National Electronic Decision Support Taskforce<sup>13</sup> identified three necessary EDS components – knowledge, rules and software. *Knowledge* is the sum of insights gained and synthesised from the many thousands of inputs to the healthcare literature every year. *Rules* are the practical implications of this knowledge for clinical practice – for example, if a patient presents with central chest pain and shortness of breath, an immediate work-up and treatment for a suspected myocardial infarction should be implemented. Knowledge and rules are the fundamental objectives of most medical research.

Currently, the electronic knowledge base/ information underpinning clinical systems is not scrutinised through a formal accreditation process. This leads to problems with inconsistency and accuracy, and potentially influences user acceptance of systems that have integrated electronic decision support functionality. Work exploring options for accreditation is currently underway to address this problem and should be continued on a nationally coordinated basis.

The third component of EDS is *software*. Today's two main types of EDS software are standalone, query-based systems that are actively interrogated by clinicians, as well as integrated decision support that piggy-backs off other activities such as clinical messaging, prescribing or ordering tests. Interviewees were often at pains to distinguish between the two. There was a feeling that standalone, query-based systems were very difficult to incorporate into a clinician's workflow, and were neither specific enough to be useful nor broad enough to cover a fair proportion of the decisions clinicians need to make.

However, decision support functionality within order entry and clinical messaging systems was seen as a major opportunity to reduce adverse events and improve cost-effective quality of care. Our inclusion of the 'clinical Information transfer and secure messaging' capability within the top ten priorities was driven above all by strong stakeholder support for its decision support potential.

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<sup>13</sup> Electronic Decision Support for Australia's Healthforce (Nov 2002), Report to Health Ministers by the National Electronic Decision Support Taskforce

#### **4.4.2 Broadband Roll-out**

Unlike many other capabilities, the broadband rollout across Australia is an issue spanning multiple sectors, including but not confined to health. As such, we believe broadband access should continue to be managed as a national cross-sectoral initiative. This approach, however, in no way dilutes the view that broadband access is fundamental to connectivity across the health system, especially for communities in more remote areas.

In this context, specific assessment of the health sector's needs and consideration of the most appropriate response (including the alternative option of a virtual private network (VPN) for health) needs to be undertaken.

### **4.5 Obstacles and Challenges**

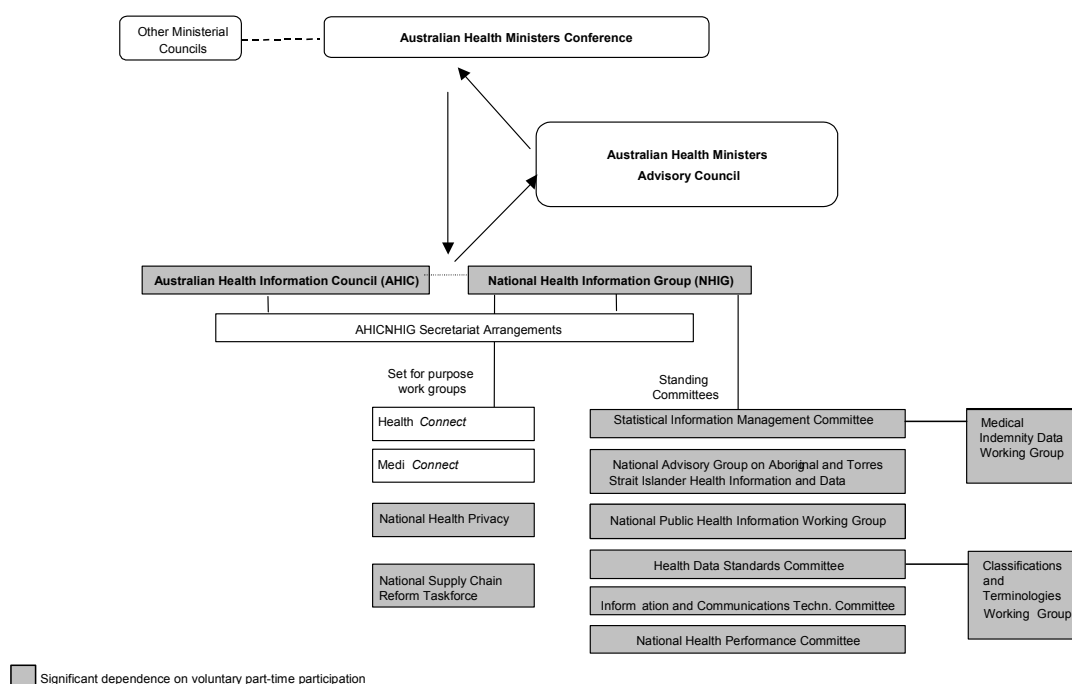
Stakeholders identified a range of potential obstacles to further progress in achieving health IM&ICT priorities. These include the following.

*Fragmented governance arrangements*, often involving committee responsibilities with less than clear decision-making authority. Committees are often incapable of resolving the critical commercial and other trade-offs required. While collapsing the separate committee arrangements for health IM&ICT into the NHIG and AHIC structure is a recent and well recognised, though largely untested, improvement, we concur with the stakeholder view that this is unlikely to be sufficient. Much time is still wasted in cross co-ordinating areas of potential overlap.

*Resourcing constraints*, particularly since many initiatives depend on individuals who become involved on a part-time and intermittent basis (so-called 'volunteer' participation). As Exhibit 4.11 illustrates, many of the working and standing committees under the new NHIG and AHIC governance structure are voluntary and/or part-time, or rely on support from individual jurisdictions. These arrangements potentially retard progress outside meeting times.

## Exhibit 4.11: Current Governance Structures & Resourcing

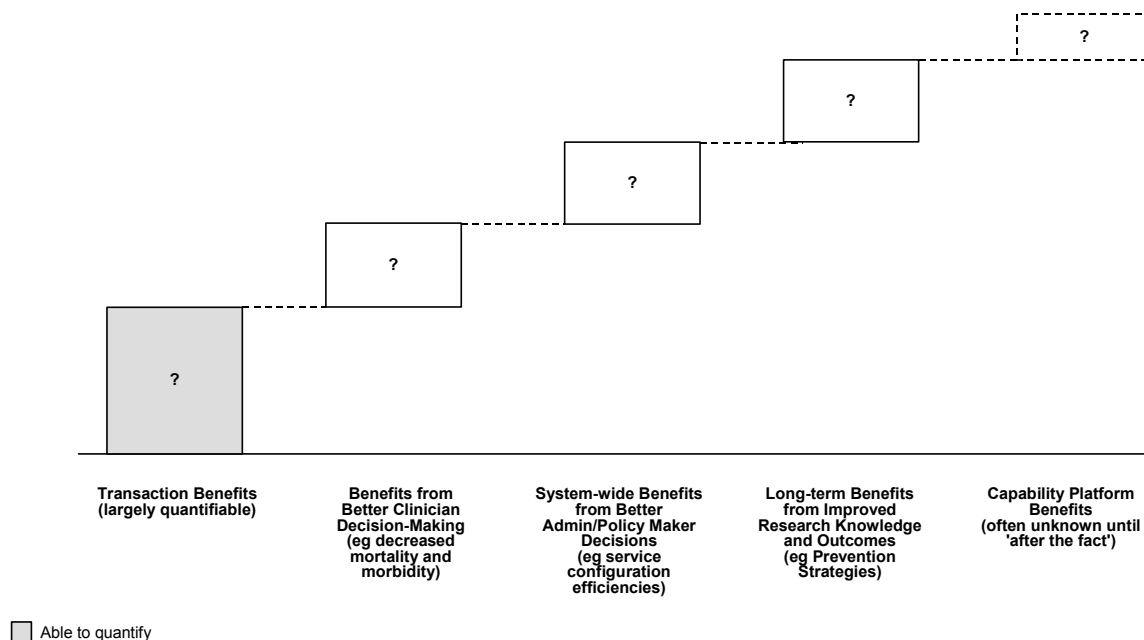
### National Health IM&ICT Governance Arrangements



Source: NHIG Memorandum of Establishment, NHIG- AHIC Submission to the AHMAC Cost-Shared Budget for 2004-05

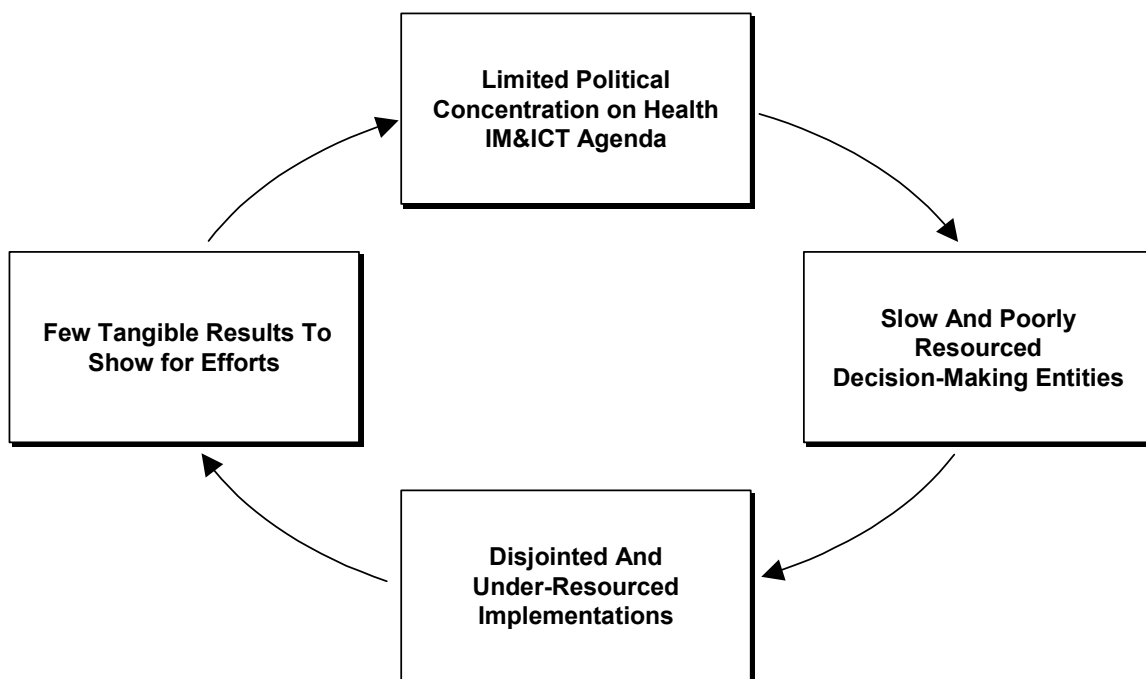
Progress in health IM&ICT is constrained by *funding challenges*. Many stakeholders told us they find it difficult to develop the robust business cases they need to convince Treasury and other key funding bodies, given that the benefits of IM&ICT investment are often fragmented and may not be directly captured by the funder(s). This is further complicated by the fact that returns are often longer term. As Exhibit 4.12 below illustrates, few of the potential benefits of a health IM&ICT investment are tangible and quantifiable. This particularly applies to the development of a new capability platform, the benefits of which are often unimaginable today.

### Exhibit 4.12: Potential Elements of A Health IM & ICT Business Case



Health IM&ICT initiatives are often 'invisible' to consumers and lacking in appeal relative to investments in physical health infrastructure, such as a new hospital or community centre. The result is a *classic policy doom loop* (Exhibit 4.13). Only strong and farsighted leadership will provide the necessary circuit breaker.

### Exhibit 4.13: The Policy 'Doom Loop'



The *absence of key standards in critical areas* fundamental to system connectivity is also an obstacle. As a result, alternative or stop-gap measures are being developed to fill the void. In addition, some stakeholders note that local software vendors lack the scale and incentives to invest when standards issues have not been resolved. Stakeholders recognise, however, that these decisions are complex, have the potential to stifle innovation and are often politically and commercially sensitive and, hence, time-consuming to resolve.

Furthermore, although there is recognition of progress on standards<sup>14</sup> both in terms of national planning and in the recent increase in standards publications, some stakeholders still perceive development and decision-making problems, as well as slower than necessary timeframes, as hindering standards approval.

Finally, where standards have been approved, stakeholders – often software vendors – complain of an inability to implement and enforce them.

Another obstacle raised by stakeholders is the challenge of *engaging providers, and other allied health professionals* in the embrace of ‘new’ IM&ICT solutions that have some impact on their day-to-day working lives. The difficulties associated with introducing new technologies to ‘time poor’ clinicians and health professionals who are sceptical about their direct benefits cannot be underestimated. Clinicians not only need to be engaged, they need to be at the forefront of driving the agenda and owning the initiatives.

The failure of many past health projects can largely be attributed to insufficient investment in training and change management, underscoring the enormity of the challenge. In the words of one stakeholder, ‘We should be spending \$8 on change management and technology uptake for every \$1 we spend on system implementation. In reality this is often the first area to suffer at the hands of budget constraints.’

Some stakeholders raised as an obstacle poor *broadband network access*, particularly in rural and remote areas. We will not achieve the vision of a connected healthcare system without the essential connectivity infrastructure. However, most stakeholders felt that this will develop over time, with or without health-sector-specific intervention.

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<sup>14</sup> Setting the Standards: a national health information standards plan for Australia (Feb 2001) and Foundations For The Future – Priorities For Health Information Standards – Action in Australia (2004-2008)



As well as network access, access to computers and terminals at the clinical 'coalface' was often cited as an additional barrier to technology uptake. Stakeholders acknowledged that, with the maturity of mobile and other technology solutions, including the use of electronic tablets at the bedside and voice recognition software, some of these barriers should decline over the next few years.

## 5 Recommendations

Four actions are critical to gaining momentum:

- Realistic expectations management for health IM&ICT
- Agreement on the identified national strategic priorities;
- The funding needed to deliver initiatives; and
- Strengthened governance arrangements to ensure coordination of the required accountabilities.

### 5.1 Expectations Management of the Vision for Health IM&ICT

There appears to be universal agreement that our health system will be transformed over the next decade as new information systems and capabilities revolutionise the way services are delivered; clinicians and allied health professionals work; resources are managed and deployed; and research and long-term public health outcomes are achieved. Most importantly, the community's knowledge and understanding of health issues, their expectations of care and quality outcomes, and their experience of the health system will change radically from today's.

A vision for the better use of information and the effective use of information and communication technologies in healthcare has been widely publicised both here and overseas. *Health Online 2001* characterised Australia's future health care system as one where:

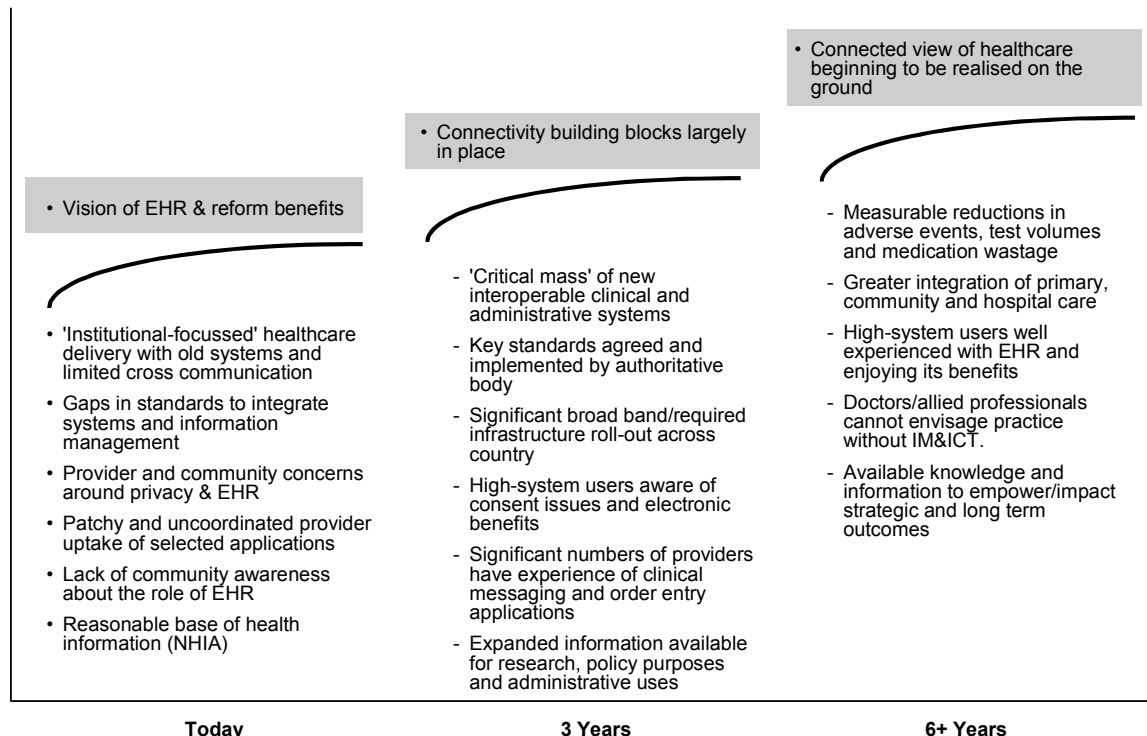
- Online access makes health services accessible to all consumers no matter how remote;
- There is seamless delivery of care across hospitals and community care, with information being available at a time and location as needed;
- A comprehensive lifetime electronic health record empowers both consumers and providers with choices and information to achieve better care and outcomes;
- High quality information is available for benchmarking, quality improvement, decision-making and policy development;
- Funders and providers are linked for online real-time transactions;
- Data are gathered as a by-product of operational systems to support health outcome monitoring, adverse event detection and other public health initiatives; and
- Security, privacy and consent issues are sensitively managed for the benefits of all stakeholders – in particular consumers, but also providers, administrators, researchers and policymakers.

This vision does not appear to be achievable in the short to medium term –say, within the next six years. There is, however, general consensus on the magnitude of the challenge, as well as recognition of the health system’s experience with more evolutionary change initiatives, its patchy record with major IM&ICT projects, and the real and major hurdle of achieving attitudinal and behavioural change at the ‘coal face’.

Many stakeholders want better and more realistic management of expectations, a more clearly agreed pathway and set of priorities to get there, and commitment in the short term to deliver on the fundamental building blocks to ensure system connectivity. There is recognition that much of this work can only be done cost-effectively under a national, collaborative approach.

Figure 5.1 lays out a phased vision for health IM&ICT over the short to medium term. It is not a comprehensive vision but attempts to set out some ‘realistic’ expectations and outcomes for the next three to six plus years. Effective management of stakeholders’ expectations about the journey and the key milestones will be critical to accessing the appropriate investment, resourcing and commitment to ensure progress.

### ***Exhibit 5.1: The Vision for Health IM&ICT***



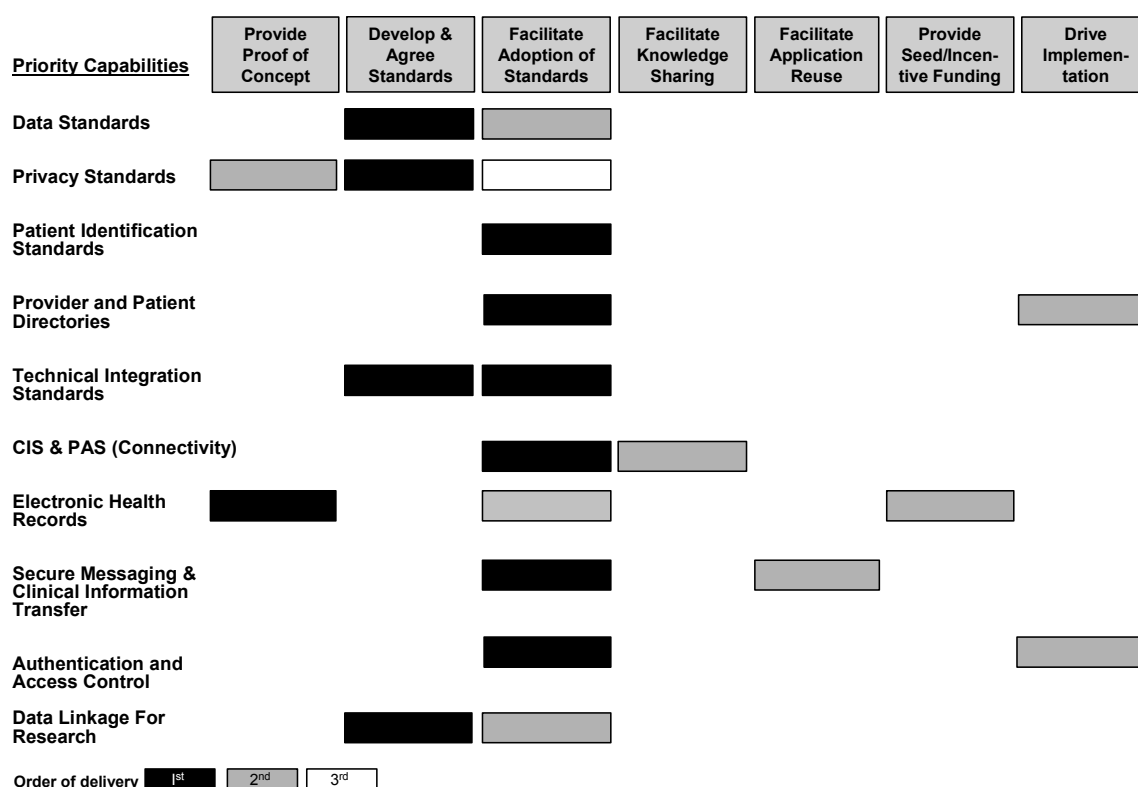
## **5.2 National Priorities and Implementation Pathways**

One overarching recommendation underpins the rest – the need for focus in the national health IM&ICT agenda. The health sector is fragmented, with control of decision-making devolved to the state or in many cases the sub-state level. There is no single body to provide cross-jurisdictional coordination. Consequently, what little national leverage exists needs to be focused on those areas where it can make a difference. In the following section, we outline proposed national roles for the top priority capabilities.

We recognise that not all stakeholders believe that a fragmented approach is a bad thing. However, in the areas that we have defined as national priorities we believe that a common national approach is essential if we are to make cost-effective progress towards system interoperability.

The national role proposed for each of the ten priority areas has been structured in line with the framework used in Section 4.3 ('common', 'connected' and 're-used'). Exhibit 5.2 provides a high-level summary of our recommendations and illustrates the full spectrum of national interventions. The spectrum extends from providing policy advice to Ministers on critical areas of commercial and political significance, to releasing policy documents on specific standards and initiatives to encourage their uptake/adoption, to driving implementation.

## Exhibit 5.2: Proposed National Focus Going Forward



Two other potential priority areas warrant comment. These are integrated decision support functionality, which should be advanced in the context of knowledge accreditation and the priority area 'clinical information transfer and secure messaging' and the broadband roll-out. The latter being a national cross-sectoral initiative as the issues and benefits of broadband span multiple sectors, including but not confined to health.

### 5.2.1 Data Standards

Data standards refer to the definitions and classifications of data elements, including data domains and coding. Data standards also include methods of data collection. Data standards are used within health care systems by clinicians, as well as for aggregation for local and national reporting. Data standards include specifications for single data elements, logical groupings of data elements, terminologies and classifications. It also includes the standard data content required for specific purposes, such as hospital discharge summaries. Data standards are essential to achieving semantic interoperability.

Stakeholders have identified two areas of data standards that warrant early focus to enable a number of other health IM&ICT initiatives.

Progress towards decision on a set of standard clinical terminologies to cover the requirements of the Australian healthcare system is essential. New CIS systems, and ultimately EHR, need to be developed to these agreed standards. Research, policy development and health system planning also rely on access to relevant aggregable, classified health data.

No single available terminology has sufficient coverage of all of the different health settings to be a standalone solution. The US SNOMED terminology may prove to be the best base or reference terminology, but this is currently under review. Several issues are still to be resolved:

- SNOMED does not explicitly relate to WHO-endorsed classifications, such as the International Classification of Diseases (ICD) and the International Classification of Functioning, Disability and Health (ICF). Other health classifications, such as the International Classification of Primary Care (ICPC), are also not supported by SNOMED. Therefore, SNOMED, if chosen, would need to be accompanied by complementary standards in the relevant priority areas, such as medicines and community health.
- SNOMED would also need significant modification to enable its effective use in the Australian clinical context. If SNOMED were to be selected, an Australian Modified (AM) version will need to be developed and maintained.

Work is in progress to develop a business case assessing the cost-effectiveness of SNOMED plus other terminology solutions. This work needs to include assessment of the overall requirements and priorities for data standards, the size, nature and pathway for investment required, and identification of the implications of such standardisation. The latter will be a prerequisite to achieving uptake of the data standards and the required changes to work practices and process flows.

The second area of data standardisation concerns a minimum set of data elements for key domains of the patient information architecture, (for example, hospital discharge summaries and patient medication records). Much of the groundwork is underway (for example, as part of the Clinical Information Project, the HealthConnect/OACIS project and MediConnect). The requirement now is a definitive statement on 'minimum EHR datasets' for each of the major clinical areas. This will facilitate the compatibility of the CIS currently planned or being implemented, providing a foundation for a future EHR.

Significant national resources should be committed to facilitating the adoption of national data standards. As discussed earlier, Australia's planned investment in this area (approximately \$6m) is significantly less than that committed in other countries. The funds needed are not inconsiderable – for example, the implementation of ICD coding in Australian hospitals cost in the order of tens of millions of dollars, and this was arguably a less complex task than national data standardisation. In addition, adequate and long-term resourcing of the National Health Data Dictionary and the national meta-data repository (METeOR) will continue to be essential.

### **5.2.2 Privacy Standards**

This area includes the legislation and/or policies that aim to protect the privacy of consumers and healthcare providers. It includes consent for both information storage and use. Privacy in health, however, needs to be considered in line with broader cross-sector privacy imperatives.

Privacy standards emerged as the most important stakeholder priority overall. The proposed National Health Privacy Code (the Code) and its mandatory guidelines are currently being developed to provide a simple framework that can subsequently be implemented in each jurisdiction. It is on track to be forwarded to Health Ministers in July 2004 and is a critical step to ensuring that a consistent, national set of privacy standards is in place. There is general agreement that further work on privacy standards should be put on hold until after the Code's development.

Our discussions with the Privacy Commission on this topic suggest that privacy is an area in which standards policy cannot be fully developed without concurrent practical testing. We therefore propose that an interim privacy and consent framework be put in place for further implementations of health information transfer initiatives (e.g. EHR). This should be rolled out on a significant scale – for example, in at least one state-wide project – and evaluated before any national legislation is formulated. The framework will almost certainly require significant rework before adoption into legislation. However, given the newness of this area, this should be seen as an inevitable part of the development process rather than an impediment to further progress.

While the legislative jurisdiction over privacy may be fragmented, it is reasonable to expect significant congruence in underlying patient expectations, and hence that outcomes of a field test in one state will be applicable to other jurisdictions.

### **5.2.3 Patient Identification Standards**

This small but important area of standards deals with the way in which patients are distinguished from one another and the authentication required to use online services. Standards for patient identification have been published by Standards Australia. A one year review showed that they were regarded as 'adequate to the purpose' by all states, notwithstanding some difficulties in changing local behaviour to adopt these standards at the regional and institutional levels. The priorities going forward will be to ensure that:

- These standards are integrated into clinical workflows and the systems built to support this integration; and
- The necessary national infrastructure (in terms of directories and interfaces) is built for all jurisdictions to use. This is addressed below.

### **5.2.4 Provider and Patient Directories**

Provider and patient directories are, by definition, the applications that maintain sufficient basic patient or provider identification data to distinguish between individuals. A patient index database is an example.

Despite the many individual jurisdiction projects underway in this area, stakeholders strongly support the implementation of a single national solution. The Health Insurance Commission (HIC) has the basic elements of both provider and patient directories and is one obvious source for this capability, but only if legislative impediments to using existing HIC registry data are overcome.

Some issues around provider identification, albeit manageable, need to be recognised. One of these is the fact that there are potentially commercial competitors to the HIC, such as the Australian Medical Association's product. In addition, some providers are concerned about placing clinical or 'linking' data with the HIC.

Three nationally driven steps are necessary to advance directories standards, and should build on the technical feasibility work currently underway by the Information and Communications Technology Committee:

- Agreement on the assignment of accountability for this function to a 'health information agency' type body, as envisaged in the governance section of our recommendations;



- Formally commissioning HIC or another organisation with responsibility for the development and maintenance of directories to a broad set of health sector requirements. The directories solution is most likely to leverage existing HIC data; and
- Establishing the interfaces and data management rules to enable multiple jurisdictions to access and edit these data. This would also include rules for data maintenance.

In summary, we envisage a direct national role in delivering this capability in future once the political and legislative barriers have been resolved.

### **5.2.5 Technical Integration Standards**

Technical integration standards are needed to ensure that data transmitted by one application can be understood and used by other applications, including, for example, messaging formats, communications protocols and middleware standards.

Most technical standards are established outside the health sector. We have assumed, as proposed by the HealthConnect Systems Architecture Project,<sup>15</sup> that the health sector will adopt these broader technical integration standards where possible.

There is already a well established international standard (HL7) over which Australia has had significant influence. Management of HL7 issues in Australia has until recently been a shared responsibility between HL7 Australia (the Australian affiliate member of HL7 Inc) and Standards Australia. HL7 Australia (an essentially volunteer group) now has responsibility for owning and maintaining the 'official Australian version' of HL7. Significant work is progressing, such as the development of an implementation guide for message usage in Australia and a strategy for Version 3 of HL7 and its harmonisation with other EHR standards.

A residual problem, however, is the fact that no single authoritative body is "directing the use of HL7" to ensure consistent implementations. As a result, many supposedly HL7-compatible applications in Australia are in fact not fully interoperable.

Further minor work may be required on the integration standards but most of the short-term focus needs to be on measures to encourage consistent adoption:

<sup>15</sup> HealthConnect Systems Architecture Project. Phase 2 – Systems Architecture Development – Draft Standards Assessment - July 2003

- The appointment of a single body (with an appropriate budget) to safeguard the official version of HL7 and be responsible for its maintenance. This body would also develop implementation rules for HL7 to be applied in accrediting applications and will need to engage industry, users and other key stakeholders in making progress. This could involve a more visible and better resourced version of HL7 Australia and/or Standards Australia IT14.
- The same body should also undertake software accreditation. Importantly, this should take into account not only compliance with the HL7 standard itself, but also the implementation rules – especially regarding the acceptable usage of the ‘z-segment’ of HL7<sup>16</sup>. However, this move will be counterproductive if it is not supported by the increased resources and sustained maintenance effort described above.
- A small integration advisory team (around five persons) should be established to assist with software accreditation and provide expert input on how to make use of HL7 in state application development activities. This team would also provide critical input to direct maintenance activities and maintain a library of public domain HL7 messages for reuse. This could be an in-house team or the task could be outsourced to a systems integrator with the necessary expertise.

### ***5.2.6 Clinical Information Systems and Patient Administration Systems (Connectivity)***

Clinical information systems (CIS) are those systems dedicated to collecting, storing, manipulating and making available clinical information important to the delivery of healthcare at an institutional level. They include specialised systems (such as pathology), primary care clinical record systems (such as Medical Director) and community-based care management systems.

Patient administration systems (PAS), on the other hand, are those systems used for patient management and transfers, facilities management, resource scheduling, claims and billing, and the storage of patients’ demographic and personal details.

A large proportion of the states’ planned development effort for the next three to five years is directed at these applications. The effort required at a national level is relatively small, but it could have a large impact on long-term system costs.

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<sup>16</sup> The Z-segment of HL7 allows for non-standardised ‘free text’ within an HL7 message. This cannot be understood by other HL7 compatible applications. Use of the z-segment has to be restricted to items that are not available from other HL7 segments for the standard to work effectively.

Future interoperability and the capacity to generate a longitudinal health record depend on cross-jurisdiction adoption of the standards. Accreditation, expert advice and rigorous maintenance and update of standards will be important in ensuring adoption.

Some additional levers may also be justified, given the critical importance of getting this right the first time. One important option to consider in leveraging current state investments is extension of the data reporting provisions in any new national health information agreement. Although these agreements are only negotiated periodically, an early commitment to including these standards is necessary because of the long lag required to implement standards in the healthcare system.

### **5.2.7 *Electronic Health Records***

Electronic health records (EHR) are longitudinal records of consumers' medical history, healthcare events, test results, prescriptions, surgery and other therapies.

Most respondents see EHR as the ultimate goal of health IM&ICT investment. The broader international IM&ICT community increasingly shares this belief. Moving to an EHR will be a very large and complex undertaking. It will require significant integration, potentially across the entire Australian health sector. The difficulty in designing, implementing and managing a longitudinal health record cannot be overstated.

While there is debate on the sensitivities and usefulness of linking together existing data sets, such as PBS & MBS data, as a basis for an EHR, this is clearly something that warrants further consideration.

While many building blocks need to be in place before an EHR is achieved, we believe that critical construction work in the form of a lead state implementation should be completed, with national support, to demonstrate the feasibility of a large scale rollout. Small pilots and trials conducted under the MediConnect and HealthConnect banners have provided valuable insights, but have not had the critical mass or been sufficiently representative to allay anxieties about feasibility and general application.

In particular, it is unlikely that the business case for EHR can be made without separate business cases for the major component parts in their own rights. For example, the hospital systems that would feed hospital data into an EHR will need cost justification on the basis of the benefits they deliver directly to hospitals. Therefore, the rollout of EHR will need to be tied to the independently cost-justified rollouts of some of the key systems components – the most significant of which are the hospital systems.

Our recommendation is twofold:

- A large implementation of the HealthConnect EHR model – based first on hospital data – should be tested at a state-wide level where the hospital system is ready to support EHR. This is largely congruent with the proposed lead state rollout of HealthConnect (to Tasmania and South Australia) recently announced by the Federal Health Minister. The funding currently committed to this aim over the next 4 years is unlikely to be sufficient for a complete rollout. Tasmania, in particular, will need to upgrade its existing hospital PAS and CIS. South Australia, on the other hand, has invested significantly in its hospital systems through the OACIS project, and is probably better placed. International experience suggests that large-scale EHR rollouts typically require investment in the order of at least several hundreds of million dollars.<sup>17</sup>
- The MediConnect initiative should be incorporated within the broader HealthConnect EHR framework. Its physical rollout should involve the same ‘field test’ state, which should adapt its architecture, consent and privacy models to match those of HealthConnect. There appear to be two options for the next phase of MediConnect trials in the context of a state-wide rollout:
  - It could focus on pharmacists first, leveraging off existing PBS billing interactions (as was the case for Pharmanet in British Columbia)<sup>18</sup> – this arrangement would deliver full coverage of prescriptions through pharmacists; or
  - It could focus on doctors’ prescribing activities, initially in hospitals, and subsequently in primary care; these data could be added to the existing longitudinal care record, with later extension to pharmacists.

### ***5.2.8 Information Transfer and Secure Messaging***

These are applications that enable the secure paperless transfer of clinical and administrative information from one provider to another, including electronic laboratory test ordering and reporting and e-prescriptions.

Most states have articulated strong business cases for doing this within hospitals in the near term. Once again, the main national priority is to ensure standards adoption and interoperability. Given that these initiatives are typically much more focused and less complex than EHR, and the interconnectivity demands more narrow, this goal appears achievable. Attention will need to be given to overcoming issues around electronic signatures, basic data and medicines coding

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<sup>17</sup> The National Programme for IT in the NHS in England. November 2003; Canada Health Infoway 2003/4 Business Plan.

<sup>18</sup> Pharmanet is an e-claims and prescription records initiative implemented across British Columbia in Canada. Pharmacists enter information onto a central medications record, and check against this record for potential interactions with existing drugs, duplicated scripts, etc. Up until recently, it did not provide e-prescribing functionality or access of doctors to medications records.

standards, as well as the EDS functionality and knowledge basis underpinning these systems. For example, in the area of medicines coding there is currently no single comprehensive medicines database to enable e-prescribing and medications management.

Standards Australia IT14 has proposed a workplan incorporating the major messaging standards needed for this capability, namely radiology, pathology, hospital discharge summaries, medications, immunisation and patient and provider identification standards. The belief is that agreement on these key standards should be achievable within a year.

### **5.2.9 Authentication and Access Control**

Authentication and access control applications facilitate access to systems' resources based on information about the user. Examples include website logon or smartcard reading software.

Relatively few interviewees, and none outside the technical sphere, mentioned authentication and access control as a priority. However, the execution of privacy and consent frameworks is critically dependent on an electronic authentication capability. Our experience with clients in the financial services industry suggests that this can be a difficult capability to implement as the technologies involved are relatively new and untested, and there is considerable complexity in the business rules needed to set and maintain authorisations.

In the health sector, basic Patient and Provider Directories must also be in place. This capability will therefore not be feasible in the short term. However, the significant expense involved, coupled with the benefits of cross-jurisdictional access, suggest that it should be done once only at a national level. HIC has the potential to contribute to such a national level authentication infrastructure through the use of its consumer and provider directories, its expertise in developing secure national systems (such as its public key infrastructure (PKI) or its 3DES encryption algorithm standard for all HIC Online services) and its privacy management of health information.

The critical next steps for advancing the authentication and access control capability are:

- Agree the standards (national business rules, role-based levels of authorisation, requirements for access to and screening out of health information, and physical validation techniques) – some of these would fall into the security standards category and others into identification standards; and
- Drive the delivery of these in a representative test situation, for example, a state-wide HealthConnect rollout.

### **5.2.10 Data Linkage For Research**

Some success has already been achieved in the area of monitoring and research. In a relatively short time and despite our fragmented healthcare system, which demands, but at the same time restricts the use of record linkage, Australia has achieved a remarkably comprehensive and consistent population health monitoring capability. This is largely due to the efforts of the AIHW and state, federal and academic research units. Australia's various health data collections, when brought together, comprise a unique resource that to date has been greatly under-utilised. Few other countries can boast electronic collections covering comparable population size.

Recent work by the DoHA and the WA Department of Health has fostered the establishment of linked data sets that support person-level epidemiological research; significant findings have already been released. However, it is early days and much more will be able to be achieved as other states join the project.

Three areas of national relevance are crucial in enabling further significant achievements in health monitoring and research:

- Firstly, there are opportunities to achieve better health data integration on a phased national basis. This potentially could be facilitated by developing a National Linkage Unit, modelled on the successful Western Australian linkage unit. Actions need to include:
  - Develop, test and implement a national standard for the systematic de-identification, linkage and access to health data for 'secondary purposes'. These include health service monitoring, adverse event detection, cost effectiveness studies and epidemiological research.
  - Develop appropriate governance mechanisms to implement the standard.
- Secondly, it is critical that new systems being built to support clinical care (e.g. CIS, PAS and EHR) take into account the needs of population health research. For example, longitudinal health records would be of enormous benefit to researchers if they were widespread, standardised and complete. Current electronic administrative data collections are lacking in clinical detail, having generally been collected for accounting purposes. A complete electronic health record could provide population level data with detail sufficient to support the most ambitious research.

- However, it should be borne in mind that overly complex or conservative consent and privacy arrangements could prevent this and thus limit the potential for providing best practice based on current evidence. If researchers' needs are ignored at the time of scoping these systems' capabilities, many of the long-term health improvement and cost benefits promised by EHR will not be realised. It will be important to not only support the current linkage and access arrangements for de-identified health data but to build in a mechanism for the controlled use of clinical data for research purposes and health outcome monitoring in new developments, such as HealthConnect.

### 5.3 Timetable for Rollout

To provide a practical illustration of the way we envisage the priority initiatives being implemented, we have listed an indicative set of three and six year achievement targets for each capability in Table 5.1. It is only indicative because we have not been able to validate the reasonableness of the targets in the timeframe (or brief) of our project. Nevertheless we believe such a table is an essential tool for managing expectations around outcomes and timeframes, and it should be refined to a point where it sets some achievable goals.

Looking forward six years, most of the capabilities involving large-scale new application deployment will probably still be in progress. However, we expect that some significant benefits from progress on health IM&ICT priorities to have begun to be realised by this stage.

**Table 5.1: Indicative Targets for Delivery of High Priority Capabilities**

Capability	Today	3 Years Time	6 Years Time
Data Standards	Standard diagnostic data in public hospital sector; standard billing and claims data	Agreed national standard for detailed clinical terminology; First version available for use Agreed national standards for all major event summaries, with hospital discharge, prescription, and community versions implemented in at least one state	Clinical terminology implemented in new Clinical Information & messaging systems, and in EHRs in lead test states  Agreed national standard clinical terminology and event summaries included in AHCA
Privacy Standards	Fragmented privacy jurisdictions with no national standards	Strawman privacy & consent policy defined and tested in lead state roll-out	Agreed and implemented national health privacy and consent policy
Patient Identification Standards	Extensive groundwork done and standards agreed, but not yet implemented	Standards adopted in all new application rollouts, including EHR lead state roll-out	All states make use of national patient identification standards
Provider & Patient Directories	Multiple planned implementations with no agreed national registry or body to implement it	Single national patient & provider registries built with at least 95% coverage for HealthConnect lead state roll-out (doctors, pharmacists, hospitals and Medicare-registered hospital patients).	Full coverage of national patient and provider populations, including paramedical professions and non-Medicare entitled patients.  At least one systematic cleansing and deduplication of databases conducted
Technical Integration Standards	Fundamental implementation and compliance issues around HL7	Single authority for health messaging and interoperability appointed and resourced; Software accreditation body set up and experience with processing at least 5 major applications	Compliance with endorsed messaging and interoperability included in Commonwealth funding agreement; All new applications approved for public sector implementation accredited HL7 compliant
Patient Administration Systems	In place for most hospitals, but standards non-compliant	At least 50% of public hospital systems are certified as standards compliant; At least 50% coverage of all primary care and community health providers with compliant systems	At least 80% of public hospital systems certified as standards compliant; At least 80% coverage of all primary care and community health providers with compliant systems
Clinical Information Systems	Patchy, incompatible coverage of hospitals; little coverage in other settings	At least 30% coverage of hospital, GP and community care settings by clinical terminology standards compliant systems.	At least 75% coverage of hospital, GP and community care settings by clinical terminology standards compliant systems.
Electronic Health Records	Standards and high-level architecture 80% agreed; Pilot sites only in place	Events accounting for at least 20% of public health care expenditure recorded on a patient linked electronic health care record in lead state(s). Detailed long term architecture agreed.	Events accounting for at least 50% of public health care expenditure recorded in lead state(s); Implementation commenced in all states
Secure Messaging & Clinical Information Transfer	Fairly widespread coverage of diagnostic results but poor coverage for referrals, discharges, and prescribing	At least 75% of pathology and radiology results and orders done by standards compliant systems.  At least 20% of discharges, referrals and prescriptions transmitted electronically	At least 90% of pathology and radiology results and orders done by standards compliant systems. At least 50% of discharges, referrals and prescriptions transmitted electronically
Authentication & Access Control	All authentication at an institutional or regional level. No cross-institutional authorisation capabilities	National EHR authentication and authorisation system piloted in at least lead state	National EHR authentication and authorisation system implemented and in use for all EHR applications, and selected new non-EHR applications with cross-jurisdictional access requirements



Exhibit 5.3 lays out a 'strawman' high-level timetable for each of the national priority capability areas. This will need to be refined with key relevant stakeholders as part of the ongoing NHIG/AHIC strategy consultation and development process.

***Exhibit 5.3: Rollout of National Priority Activities***

National Priority	Year 1 (2004)	Year 2 (2005)	Year 3 (2006)
<b>Data Standards</b>			
• Business-case Development / Decision on terminology sets / Roadmap			
• Terminology development			
• Pilot			
• Datasets development and approval	(eg top 5 priority areas)	(eg next 10 priority areas)	
<b>Privacy Standards</b>			
• Interim privacy / consent framework research and development			
• Testing / refinement in state-wide EHR rollout			
• Simplifying legislative environment			
• National implementation			Ongoing
<b>Patient and Provider Identification Standards</b>			
• Adoption	Patient	Provider	
• Implementation support			Ongoing
<b>Patient and Provider Directories</b>			
• Agree approach and national accountability			
• Development			
• Uptake of common registry (and maintenance)			Ongoing
<b>Technical Integration Standards</b>			
• Agree Australian HL7 modifications and authorised body			
• Ongoing maintenance, implementation and software accreditation			Ongoing
<b>CIS / PAS</b>			
• Adoption of interoperability standards			(Rolling priority dependent on CIS/PAS implementation timing)
<b>EHR / HealthConnect</b>			
• Planning for lead-state roll-out			
• Lead state roll-out and evaluation			Ongoing
<b>Information Transfer and Secure Messaging</b>			
• Standards agreement			
• Implementation			Ongoing
<b>Authentication and Access Control</b>			
• Standards agreement			
• Test in lead state roll-out			Ongoing

## 5.4 Funding

A firm recommendation on the appropriate level of funding required to deliver the national health IM&ICT agenda is outside our brief. However, we believe the following comments are relevant and important at this time.

The quantum of national funding will have a major impact on the pace at which Australia proceeds towards an electronically enabled healthcare system. Meeting stakeholder expectations of reasonable progress to outcomes will require significant investment.

There is an urgent need to develop a realistic view on the funding required to deliver health system reform through IM&ICT in the short to medium term. Relative to other nations, Australia appears to be under-investing, with projected national funding of \$80 million over the next 4 years for lead state rollout of HealthConnect and a budget request of \$2.6 million for 2004 to fund the standing committees and working party activities of NHIG/AHIC.<sup>19</sup> State government investment in new PAS/CIS systems in the order of \$350 million over the next 2 years should also be considered in this context, as should the Australian Government's \$430 million in incentive payments to GPs to enable them to become computerised.

These funding levels are still significantly less than Canada's estimates of an investment of around \$2.5 billion over the next 5 years to get interconnectivity across 50% of its providers. Projected expenditure in the UK is much larger still.

Australia's quantum of investment is even less if one considers that national funding arrangements through NHIG and AHIC appear to be a mix of special one-off policy and development initiatives as well as maintenance activities to ensure the status quo. An example of these 'business as usual' activities might be the essential activities undertaken regularly to maintain the data dictionary. In future these activities should be recognised as distinct and funded separately.

At a minimum, any funding for the national health IM&ICT agenda needs to be supported by governance arrangements designed to deliver fundamental reform. As such NHIG/AHIC need to ensure that their work programs/agendas are reviewed and the limited national resources allocated in line with these priority reform areas.

## **5.5 Implications For Governance Arrangements**

Not only will all of the ten high priority capabilities require adequate funding, extensive cross-jurisdictional effort and collaboration will be necessary to achieve real progress. To achieve traction in the high priority areas, a number of prerequisites need to be in place, including:

- Strong support from all jurisdictions for the agreed priorities and the entity(ies) charged with delivering them;
- Clear accountability for achieving progress;
- The flexibility to alter priorities and move resources when required;
- The ability to expedite decision-making;
- The ability to effectively coordinate the necessary interactions between the various projects;
- A good and proactive working relationship with key stakeholders across all jurisdictions, and the ability for stakeholders to consult and work together between key meetings;

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<sup>19</sup> This budget is currently before AHMAC and still in the process of being approved.

- The expertise needed to get on top of the key issues quickly;
- Sufficient focus to get results; and
- Adequate funding.

As discussed earlier, we do not believe that the current NHIG/AHIC governance arrangements meet the majority of these requirements. In particular:

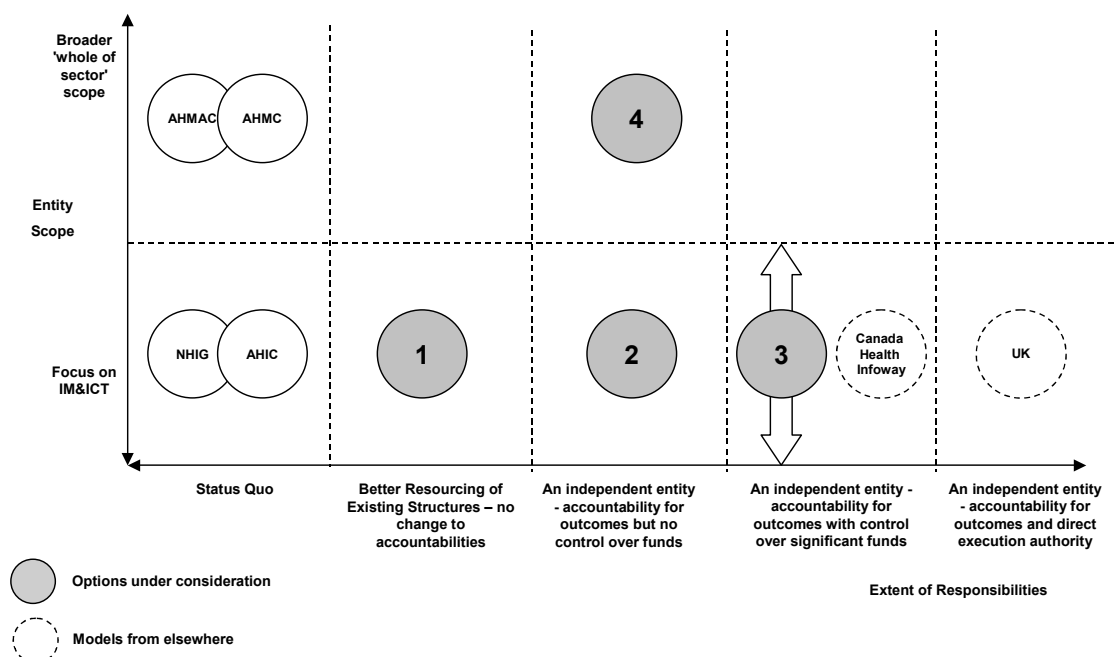
- HealthConnect and MediConnect have had mixed support from the states, in part because, while they technically report through NHIG/AHIC, they are in reality being driven by the Australian Government, out of the Australian Department of Health and Ageing;
- Accountability for achieving progress is diffused across the committees and, at times, can be left in the hands of a few passionate enthusiasts;
- The nature of the committees involved does not provide the flexibility needed to adjust priorities on an ongoing basis;
- Decision making is impeded by committee meeting cycles and the complexity of the business transacted in meetings;
- The ability to coordinate the various activities is limited by the very light resourcing of the NHIG/AHIC secretariats;
- Resources are not available to proactively engage stakeholders between meetings;
- Access to expertise is limited;
- Focus is diffuse; and
- Funding is not adequate

Consequently, the concluding section of our recommendations is devoted to the proposed changes to health IM&ICT governance structures and the creation of a new body.

### ***5.5.1 Strengthened Governance Arrangements***

Exhibit 5.4 shows a spectrum of options for strengthening health IM&ICT governance.

**Exhibit 5.4: Range of Governance Options**



At a minimum, resources could be added to the existing committee structure of committees so they are able to make better progress at and between meetings (Position 1). Such resources may enable committees to have a full-time secretariat and some full-time staff.

As a next step, a new entity could be created with full-time staff members who are accountable for prioritising and coordinating all the national health IM&ICT activities and delivering results (Position 2). Such an entity would have a catalytic and co-ordinating role, and not control significant funding as national programs like HealthConnect would remain outside of its funding control. One major shortfall of this model is that without control over funding, the entity's authority and credibility would be limited. As such it may not represent a sufficiently significant move on from Position One to justify the creation of a separate entity.

A further step along the governance responsibilities continuum would be to direct significant funding through the new entity for investment in major national priority health IM&ICT projects (Position 3). This would give the entity control of the national health IM&ICT masterplan to ensure system interoperability and connectivity.

A version of this model is what Canada has adopted with the creation of Infoway. Infoway has been allocated C\$1.1billion for co-investing with the provinces and territories in projects that will help build the national health IM&ICT infrastructure and move Canada towards a longitudinal EHR.

The most far-reaching step would be to establish a far larger independent entity with responsibility for actually managing the implementation. This is the position adopted by the UK.

A related question is the appropriate scope for the new entity. This is shown on the vertical axis of Exhibit 5.3. The temptation in creating a new entity would be to give it accountability for other 'national health priorities', over and above IM&ICT. Some of these health priorities, such as quality and safety, are currently the responsibility of other committees reporting through AHMAC to the AHMC. Position 4 on Exhibit 5.3 illustrates this option.

We recommend an initial focus on health IM&ICT to ensure that the entity's task is focussed and manageable, and that it works to deliver clearly articulated expectations and outcomes. The addition of further areas of responsibility could be considered later, if the model is deemed to be successful.

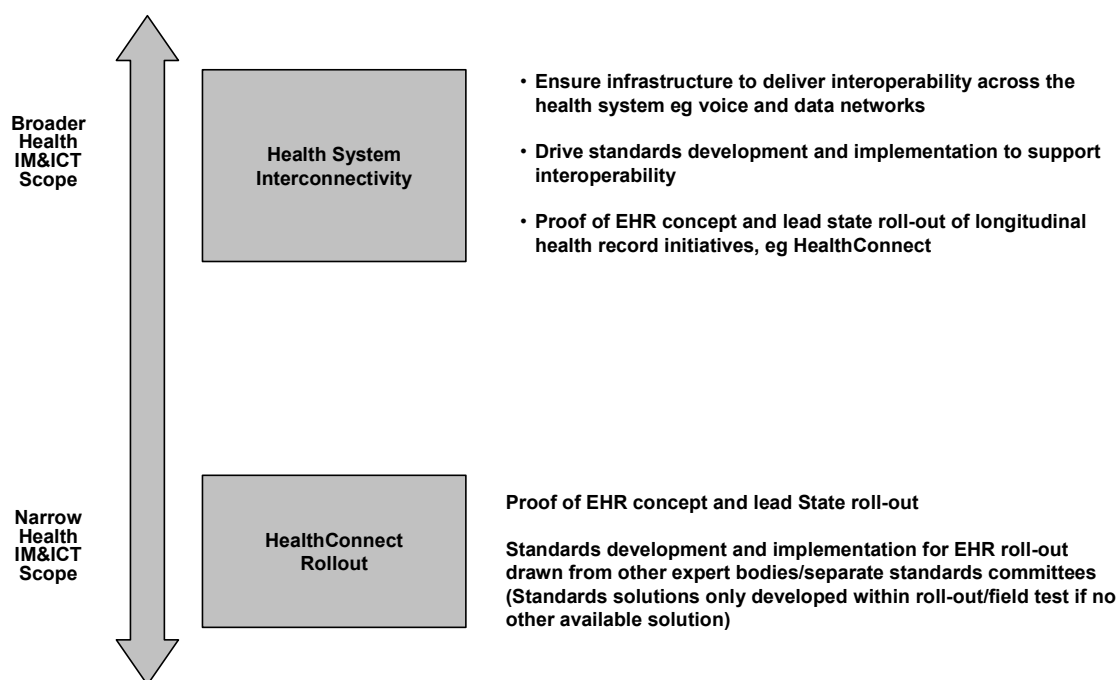
In our view, the creation of a new entity (Position 3 as described above), is a necessary step if real progress is to be achieved in this complex area. Exhibit 5.5 below summarises some of the reasoning behind this recommendation.

#### ***Exhibit 5.5 Comparison of Governance Options***

Critical success drivers	Option 1 – better resourced status quo	Option 2 – Single body accountable for national IM&ICT delivery	Option 3 – Accountability for IM&ICT delivery and funds allocation	Option 4 – Accountability for broader health reform delivery
Clear accountability for outcomes	<b>X</b> • Accountability still diffuse	✓ • Catalytic and co-ordinating role only	✓✓ • Greater control of outcomes because of funding control	✓ • Potentially less focus on IM&ICT issues
Effective Prioritisation	✓ • Accountability still diffuse	✓ • Lack of funding control would limit effectiveness	✓✓✓ • Potential to better align priorities and funding	✓ • Potentially less focus on IM&ICT issues
Able to marshal required expertise	<b>X</b> • Limited	✓ • Limited full-time dedicated staff	✓✓ • Funding control gives potentially greater access to required expertise	✓✓ • Funding control gives potentially greater access to required expertise
Better adoption/enforcement of decisions	✓ • Improved but still limited follow-through	✓ • Lack of funding control may limit impact	✓✓ • Greater opportunity to commit funds to implementation/enforcement if required	✓ • Potentially less focus on IM&ICT issues
Retains confidence of jurisdictions	✓✓✓ • Jurisdictional representation and executive decision-making power with NHIG	✓✓ • Depends on jurisdictional representation and influence on the new entity and its Board	✓✓ • Depends on jurisdictional representation and influence on the new entity and its Board	✓✓ • Depends on jurisdictional representation and influence on the new entity and its Board

Within health IM&ICT, this entity's role could be circumscribed or broader, as illustrated in Figure 5.6. We believe the new entity should be responsible for health system interconnectivity, including, but not exclusively, EHR implementation. This will be essential for continued cross-jurisdiction (particularly state and territory) support and buy-in. As such, the entity would be accountable for outcomes and control the funding and resources currently going to national IM&ICT priorities.

***Exhibit 5.6: Potential Breadth and Scope of Health IM&ICT Entity***



The difference that a new entity as described could achieve, in comparison with current governance arrangements, is shown in the Exhibit 5.7.

### ***Exhibit 5.7: Comparison of Governance Options – Today Versus a New Independent Entity***

Today's model		New Independent Entity
Part time committees, with part time secretariats	▶	Full time team with full time change manager as CEO
Significant burden on committees to reach decision on complex issues. Diffuse accountability	▶	Takes accountability for delivering against timelines
Limited ability to proactively manage across stakeholders	▶	Proactively interacts and manages stakeholders to maximise prospect of gaining agreement
Decisions need to be batched for key committee meetings	▶	Able to coordinate across projects on an ongoing basis
Limited resources allocated across committees and reviewed infrequently	▶	Able to review progress of teams and adjust resourcing allocation on an ongoing basis.
Limited capability to ensure follow through on decisions	▶	Able to follow through on key decisions to drive implementation

#### ***5.5.2 'Strawman' Independent Health IM&ICT Entity***

Given the short timeframe for this review, we cannot recommend a definitive model for a new health IM&ICT entity. However, we have developed a 'strawman' to help stimulate discussion among key stakeholders.

The new agency needs to build on the strong commitment to national collaboration and early trust established by NHIG and AHIC since their creation late in 2003. It should assume executive decision-making powers and accountability for the majority of NHIG's existing responsibilities, including its standing committees and working parties. Some, if not all of these, will continue to exist but be guided and resourced by the new entity. This accountability should extend to HealthConnect. A reconstituted NHIG would still be required as an important reference body to AHMAC and the new entity, to ensure that it remains closely in touch with the views of all jurisdictions. NHIG would also retain responsibility for certain areas, such as the ongoing work around the Data Dictionary and the Australian Healthcare Agreement. AHIC should continue in its current form and with a similar expert advisory role to the one it has today.

The entity should deploy several levers to deliver its charter, including;

- A strong communication and advocacy role on national health IM&ICT priorities. This includes setting clear expectations for all initiatives, reporting on progress (and any issues affecting progress) and formally evaluating major development and implementation initiatives. These learnings should be shared and applied across jurisdictions as appropriate.
- In addition, the entity may need to assume responsibility for knowledge and system accreditation, if this is deemed essential for delivery on national priorities. This may be required in some areas of standards (as identified in the national implementation pathways section above) and to ensure a robust electronic knowledge base to underpin future clinical systems.
- One of the entity's main roles should be to review and make recommendations on the level of funding needed to deliver desired outcomes in appropriate timeframes. Obvious trade-offs need to be made about the pace of reform and the level of investment.
- Once the entity is established, it could become a national expert reference centre for important areas in health IM&ICT. This primarily would be a by-product of the entity's core activities in advancing the connectivity agenda. As such, it could include areas such as health IM&ICT business case development, evaluation frameworks/informatics research, and key aspects of provider change management. These capabilities are essential to evaluating our success and refining our progress towards a national health services infrastructure.
- We believe the new entity should be focused on health IM&ICT initially, without broader healthcare responsibility. It should be directly accountable for the delivery of certain outcomes, through contracting with relevant parties and jurisdictions as appropriate. For example, the Australian Institute of Health and Welfare (AIHW) would presumably continue to be contracted for some data standards development work and population health studies as could Western Australia for data linkage and the HIC on provider identification issues.

The entity should be established for a finite period – say, 5 years. It should be expected to achieve certain milestones, as defined by the national priorities and timeline, by the end of each year of its operation. Its future beyond its initial 5-year life should be determined on the basis of its track record. As a safeguard, a formal review of its performance could be conducted three years into its life.

An intergovernmental agreement will be required to establish the new entity as an independent body. It need not be a statutory authority and could have a company structure to ensure adequate fiduciary responsibility.



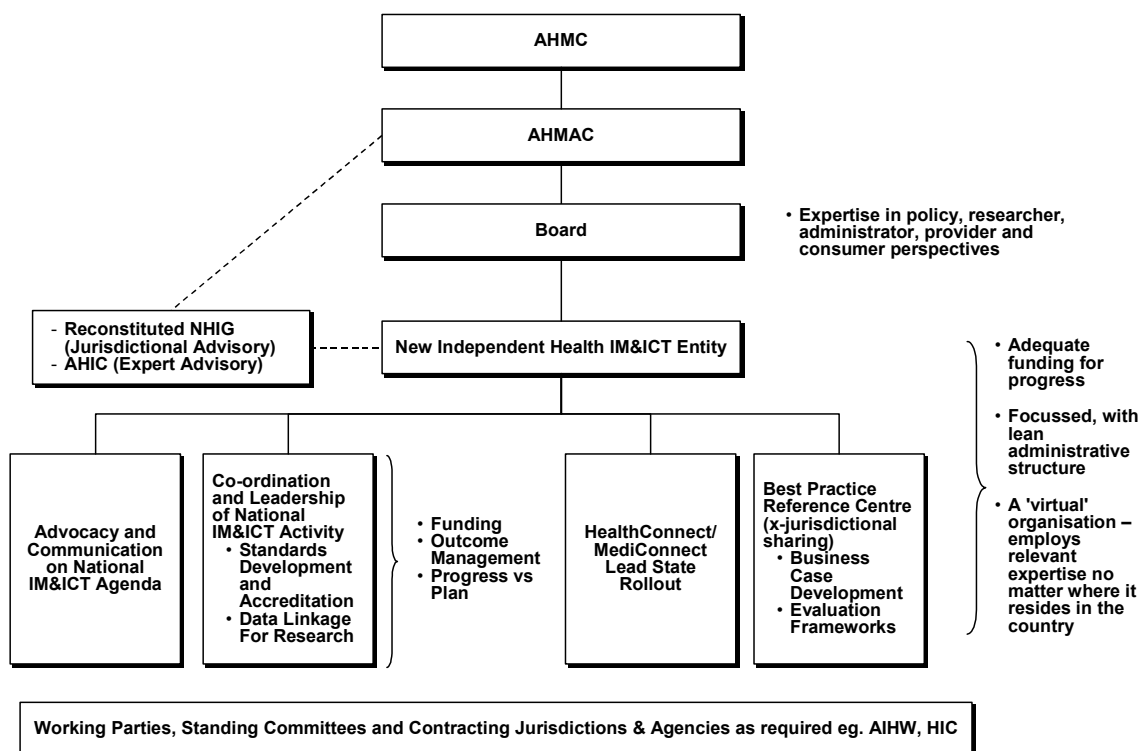
The entity should report through the Australian Health Ministers Advisory Council (AHMAC) to the Australian Health Ministers Conference (AHMC). This reporting should include its strategic direction, budget approval and progress against agreed key performance indicators. The entity's board should also be selected and appointed by the AHMC through AHMAC. Its formal authority will derive from agreement on its strategy and budget by all Health Ministers meeting in AHMC.

In practice, the new entity would have no capacity to direct jurisdictions to pursue certain courses. Its success would depend on its powers of persuasion and encouragement, backed up by some financial inducement. In addition, the entity's performance in meeting agreed goals would be publicised. The quality of the board and the personal capacity of the CEO would largely determine the new entity's success.

Funding for the proposed entity should be provided through a joint Australian Government and state and territory government funding initiative. The agency should be responsible for all the allocation of national health IM&ICT funding – for example, the recently announced \$80m to support the next phase of the HealthConnect rollout to 2007 should be channelled to the new entity.

Figure 5.7 is a 'strawman' model for the new independent Health IM&ICT entity and Figure 5.8 summarises some of its key features.

***Exhibit 5.8: 'Strawman' Model for the Proposed Independent Health IM&ICT Entity***



***Exhibit 5.9: Key Feature of Proposed Independent Health IM&ICT Entity***

Characteristic Of Independent Health IM&ICT Entity	Recommendation
<b>Role</b>	<ul style="list-style-type: none"> <li>• Coordinating and driving national health IM&amp;ICT priorities (current NHIG/AHIC responsibilities)</li> <li>• Includes accountability for HealthConnect/MediConnect (assumes role from the Australian Government's Department of Health and Ageing)</li> <li>• Advocacy role and communication with all relevant stakeholders on expectations, progress and issues</li> <li>• Setting clear standards and expectations for all projects funded, including evaluation requirements</li> <li>• Actively supporting experience-sharing and transfer across jurisdictions as appropriate</li> <li>• May include organising new functions such as knowledge and system accreditation if essential to national priority delivery</li> <li>• Making recommendations on funding levels required to deliver desired outcomes</li> </ul>
<b>Goals and Strategy</b>	<ul style="list-style-type: none"> <li>• Set by AHMC, advised by AHMAC</li> </ul>
<b>Reporting structure</b>	<ul style="list-style-type: none"> <li>• Will report through AHMAC to AHMC. Strategy, annual budget sign-off and progress against KPIs to be reported twice yearly through AHMAC to AHMC.</li> </ul>
<b>Relationship to other bodies</b>	<ul style="list-style-type: none"> <li>• NHIG should be reconstituted as a jurisdictional advisory body, advising both the NHMC and the new entity on policy and implementation issues</li> <li>• AHIC should be retained as an expert policy advisory body, both to the NHMC and the new entity's board</li> <li>• Other standing committees, directed and funded by the new entity</li> </ul>
<b>Organisation</b>	<ul style="list-style-type: none"> <li>• Size will ultimately be dependent on scope</li> <li>• 'Small' and flexible (a lean administration)</li> <li>• A 'virtual' organisation drawing on and employing expert resources wherever they reside</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Joint Australian Government and State funding for Health IM&amp;ICT development</li> <li>• Will include HealthConnect/MediConnect funding</li> </ul>
<b>Period of existence</b>	<ul style="list-style-type: none"> <li>• Initially for 5 years, with potential to extend, dependent on track record</li> <li>• Formal external review of performance at 3 years</li> </ul>

Characteristic Of Independent Health IM&ICT Entity	Recommendation
<b>CEO</b>	<p>Two potential options for appointing the CEO:</p> <ul style="list-style-type: none"> <li>• Australian Government responsibility (with a majority of states having veto rights)</li> <li>• The entity's Board assumes responsibility for selecting the CEO</li> </ul> <p>CEO will need to have the following characteristics:</p> <ul style="list-style-type: none"> <li>• A strong leader of change and an influencer</li> <li>• Respected by governments and other key stakeholders, such as clinicians/health professionals</li> <li>• An excellent and persuasive public speaker as well as effective advocate</li> <li>• Practical and focussed, able to get things done</li> <li>• Knowledgeable but not necessarily a deep expert in Health IM&amp;ICT</li> <li>• The right mix of business/management/health experience</li> </ul>
<b>Board composition &amp; appointment</b>	<ul style="list-style-type: none"> <li>• Expert Board appointed by AHMC through AHMAC (not representative of jurisdictions or interest groups)</li> <li>• Board with expert knowledge relevant to key stakeholders (providers, consumers, administrators, researchers and policymakers)</li> </ul>
<b>Status of entity</b>	<ul style="list-style-type: none"> <li>• Body established by intergovernmental agreement. Not a statutory authority, but could have a company structure to ensure adequate fiduciary framework.</li> </ul>

## 6 Next Steps

We believe three areas require consideration and urgent action, assuming general endorsement of the need for a national health IM&ICT agenda, the priority set and the creation of a new, independent health IM&ICT entity. These are:

1. Confirmation of and sign-off on the detailed national strategy and the priority health IM&ICT initiatives, initially by NHIG and AHIC and ultimately by AHMAC and AHMC. This strategy will need to be aligned with and set the direction for all existing national standing committees and working groups over the next 3 plus years.
2. The determination of the funding required to implement the national priorities, including the phasing of that funding over time.
3. Further work on the development and design of the new independent health IM&ICT governance entity. This will need to include decisions on funding, as well as on organisational roles, responsibilities, resourcing and size.

# 1 Appendix

## 1.1 Glossary of Terms and Acronyms

Term	Definition
AHIC	Australian Health Information Council
AHMAC	Australian Health Ministers Advisory Council
AHMC	Australian Health Ministers Council
AIHW	Australian Institute of Health and Welfare
Allied Health Professionals	Includes all non-medical service providers, such as nursing, physiotherapy, occupational therapy, podiatry, national therapy professionals etc
BCG	The Boston Consulting Group
CIS	Clinical information systems
Clinician	Refers to all types of medical practitioners, both general practitioners and specialists
DoHA	(Australian Government) Department of Health and Ageing
EDSS	Electronic decision support systems(s)
EHR	Electronic health record
GPCG	General Practice Computing Group
HealthConnect	HealthConnect is the proposed National Health information network to facilitate the safe collection, storage and exchange of consumer health information between authorised health care providers. Work is being undertaken by a joint Australian Government, State and Territory HealthConnect program office.
HIC	Health Insurance Commission
HL7	Health Level 7
ICD coding	International Classification of Diseases, such as ICD 10
ICF	International Classification of Functioning
IM&ICT	Information Management and Information and Communications Technology
InfoWay	The independent not-for-profit Canadian body with responsibility for facilitating and accelerating the development and adoption of health information systems in Canada
MediConnect	MediConnect is a secure national electronic system to help improve quality and safety in the way we manage medicines. Trials are currently being conducted in Launceston and Ballarat
NHIG	National Health Information Group
NHMAC	National Health Ministers' Advisory Council
OACIS Project	The South Australian HealthConnect clinical information systems pilot a cross major metropolitan hospitals
PAS	Patient administration systems
Pharmanet	A shared electronic prescribing, medications information and drug claims service for pharmacists in British Columbia, Canada

Providers	All health professionals (clinicians and allied health professionals) providing services to consumers
SNOMED CT	SNOMED CT is a clinical terminology and infrastructure. It provides a common language for capturing, sharing and aggregating health data across specialties and sites of care

## 1.2 Capability Definitions

Capability	Definition
<b>Standards</b>	
Security standards	Standards that define the hardware and software infrastructure required to prevent unauthorised access to IT systems
Privacy and consent standards	Legislation and/or policies that aim to adequately protect the privacy of consumers and healthcare providers, and elicit their consent for information storage and use that might be construed to threaten their privacy, in line with broader cross-sector privacy imperatives
Identification standards	Standards that facilitate the identification of consumers, health providers and locations (e.g. Unique Patient Identifier), and their authentication to use online services
Data standards	Data Standards refer to the definitions and classifications of data elements, including data domains and coding. Data standards also include methods of data collection. Data standards are used within health care systems by clinicians, as well as for aggregation for local and national reporting. Data standards include specifications for single data elements, logical groupings of data elements, terminologies and classifications. It also includes the data content required for specific purposes, such as hospital discharge summaries. Data standards are essential to achieving semantic interoperability.
Technical integration standards	Standards that define the technology required to enable systems to communicate with each other. May include messaging formats; communications protocols and middleware standards.

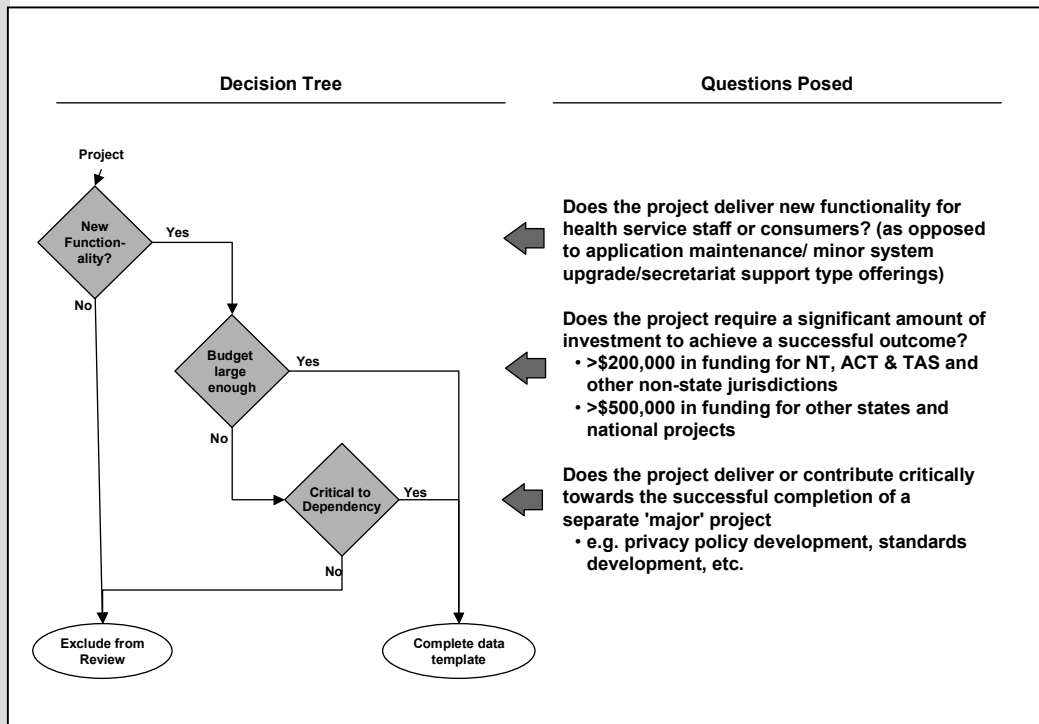


Capability	Definition
<b>Physical Infrastructure</b>	
Voice & data networks	Communications links, switching equipment, hubs and routers that link provider systems in different locations to each other, and to the outside world, for the purpose of voice and data exchange
Call centres	Facilities and associated infrastructure designed to handle a large volume of health-related enquiries via the telephone (e.g. HealthFirst call centre in ACT)
Data centres	Centralised facilities designed to house the physical hardware that runs health-related services and applications, and store the underlying data
End-User Computing	Computer systems and access devices used by health professionals and consumers access health information e.g. Desktop computers, PDAs, printers.
<b>End User Applications</b>	
Claims & billing	Systems used to deliver, receive, manage and pay claims for payment to funding agencies or patients
Performance management / quality assurance (QA)	Systems to assess measure and compare performance for states, institutions/corporations or individuals across the healthcare system
Data capture and translation	The collection of accurate and reliable health information to assist in medical research and health policy development
Provision of Health Information to the Public	Application that provides consumers access to reliable health information that will help them drive choice of treatment
Patient administration system (PAS)	Information system used for patient management and transfers, facility management, resource scheduling, bill calculation, and storage of patient demographic and personal details
Clinical information systems (CIS)	System dedicated to collecting, storing, manipulating and making available clinical information important to the delivery of healthcare at an institutional level. It includes specialised systems (e.g. pathology systems), primary care clinical record systems (e.g. Medical Director) and Community based care management systems.
Telehealth	Use of communications technologies to facilitate the remote interactions between healthcare professionals and patients for the purpose of clinical care. (e.g. videoconferencing for psychiatric interviews)

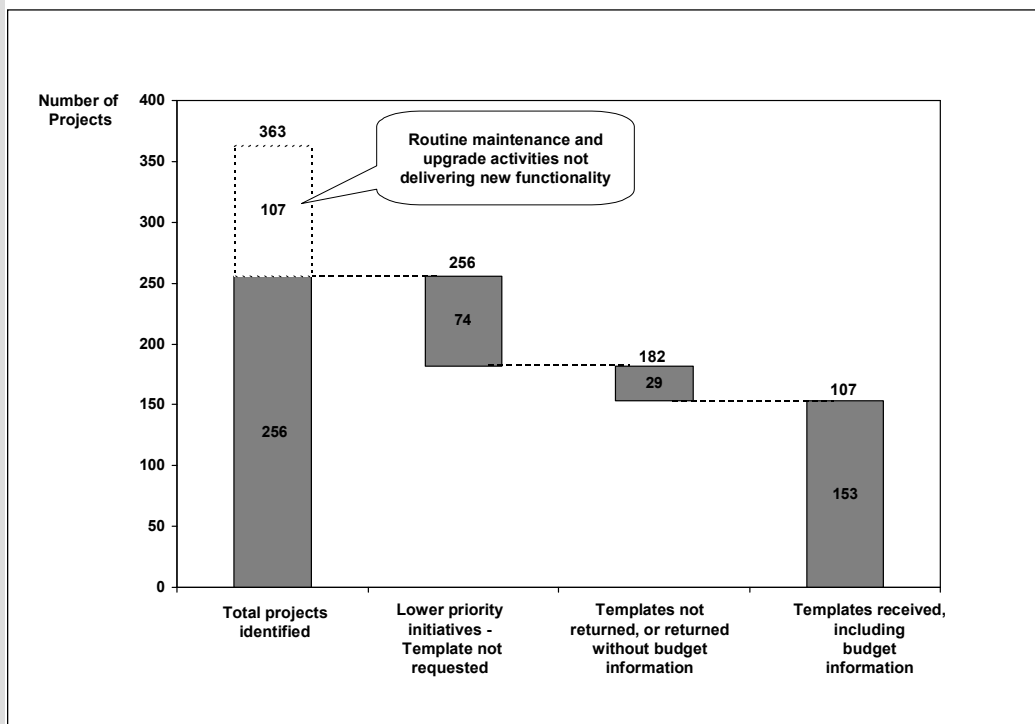
Capability	Definition
Information Transfer and Secure Messaging	Applications that enable the secure paperless transfer of medical and administrative information from one provider to another (e.g. electronic lab test ordering and reporting, e-Prescriptions)
Patient and provider directories	Applications that maintain sufficient basic patient or provider identification data to distinguish between individuals (e.g. Patient index database)
Authentication & Access Control	Applications that facilitate access to systems resources based on information about the user (e.g. website logon, smartcard reading software)
Data warehousing	Systems used for storing, retrieving and managing large amounts of information for off-line, analytic purposes
<b>End User Applications</b>	
Finance	Applications that deal with accounting and monetary transactions (e.g. accounts receivables and payables, general ledger)
HR	Applications that manage the administrative aspects of the employees in the health sector, e.g. recruitment, payroll, entitlements
Procurement	Applications that assist in coordinating and the purchasing of medical equipment and supplies
Asset Management	Applications that assist health administrators to keep track of, refresh or replace their institutional assets
Electronic health record	A centralised longitudinal record of consumer's medical history, health care events, test results, and prescriptions, surgery and other therapies received
[Clinical] decision support systems	A system that uses best practice information to actively guide clinical decisions by providers, either when requested, or when patient data suggests guidance is necessary
<b>Change Management</b>	
Change management	Overall coordination and execution of changes to work practices, skills and incentives to make use of Health IM&ICT
Capacity Building	Provision of skills to IM&ICT user groups to enable correct use of technologies
Incentives & Penalties	Positive inducements to use health IM&ICT correctly and/or censure (threatened or actual) resulting from failure to make use of them
Evaluation	Rigorous assessment of IM&ICT activities to determine their implementation costs and value delivered, and improve understanding of design, development & implementation approaches

### 1.3 Approach For Identifying Priority Projects

**Exhibit 1.31. Approach used to identify 'major' projects**



**Exhibit 1.32. Health IM & ICT projects identified**



## 1.4 Major Project Data Collection Template

[Template]

Administration	Your Name:		
	Organisation:		
	Job Title:		
	Contact Phone:		
	Contact Email:		
General Information	Project Name:	[Template]	
	Relevant Acronym:		
	Description/Objectives:		Provide a brief overview of the project including the objectives it attempts to achieve.
	Project Type 1:		Select upto two topics that <i>best</i> characterise this IT project in the objectives it attempts to achieve.
	Project Type 2:		
Project Scope	Clinical Scope:		Select the most appropriate clinical scope for this project from the drop-down list.
	Medical Condition(s):		If relevant, provide the specific medical condition(s) this project relate to (e.g. diabetes)
	Geographical Scope:		Select the most appropriate geographical scope for this project from the drop-down list.
	Deliverables:		Outline the major deliverables for this project (e.g. report, pilot, full implementation). Please limit the number of major deliverables to a maximum of five.
	Sponsor:		Name(s) of the relevant government agencies, healthcare providers or private organisations <i>responsible</i> for this project.
	Stakeholders:		List the major stakeholders <i>involved</i> in this project (names of organisations).
	End-Users:		List all the different elements of the health system that will be impacted by the implementation of this project (e.g. hospitals, patients, GPs, imaging clinicals, government departments, etc.)
Benefits	Expected Benefits:		List the high-level benefits that are expected to be derived as a result of successfully completing this project.
	Financial Benefits:		List the direct financial benefits that are expected to be derived as a result of successfully completing this project (e.g. cost savings). Provide quantifications (\$\$\$s) where this information is readily available.

Investment	Original Budget:		Original funding allocated to this project.
	Investment Required:		Total funding required to bring the project to completion.
	Committed Funding:		Total current funding committed towards the completion of this project.
	Funding Parties:		Australian Government, state and private organisations that are responsible for funding this project. Please indicate split of funding across funding parties where this information is available.
Timing / Status	Start Date:		Date on which this project officially commenced or will commence (month + year).
	Committed End-Date:		Date on which the project deliverable is expected to be completed and signed off (month + year).
	Current Phase / Stage:		Select the description that <u>best</u> communicates the current state of the project.
	Project Status:		Select the description that <u>best</u> communicates current progress towards the deliverables.
	Achievements To Date:		List the (interim) achievements that this project has realised to date.
Dependencies / Risks	'Dependent' Projects:		List the projects that depend on the successful completion of this project to succeed or start.
	'Enabling' Projects:		List the projects that deliver capabilities required for the successful completion of this project.
	Similar Projects		List other projects (within other jurisdictions) that have similar objectives (if known).
	Risks:		Briefly outline the factors that will adversely affect the successful outcome of this project.
Supporting Documentation	Business Case Available?		Indicate whether a business case has been prepared for this project.
	Budget Submission Available?		Indicate whether a budget submission has been prepared for this project.
	Supporting Legislation / Papers:		Please name any legislation or government papers that serve as background to this project.
	Project Website Address:	<a href="http://">http://</a>	If available
	Additional Comments:		Provide any additional comments or information that is relevant to this project.
Project Manager	Name:		Person responsible for the day-to-day running of this project.
	Phone:		
	Email:		

## 1.5 National Capability Prioritisation Matrix – Background Data

Project Type	Dependency	Priority	Inverse dependency	Combined case for action	Total feasibility	Presence of a champion	Technical implementation	Governance complexity	Political issues	Cultural challenge	Resource requirements
1 Infrastructure - Call Centres	3	4	0	1	2.7	2	3	3	3	3	2
1 Infrastructure - Data & voice Networks	2	1	3	4	7	3	2	3	3	3	1
1 Infrastructure - Data Centres	2	1	0	4	2.5	2	2	3	3	3	2
1 Infrastructure - End-User Computing	4	1				1	3	3	3	3	1
2 Standards - Data / Coding Standards	1	1	14	4	18	2	3	2	2	1	3
2 Standards - Identification	1	1	13	4	17	3	3	2	1	1	3
2 Standards - Privacy / Consent	1	1	16	4	20	1	2	1	1	1	3
2 Standards - Security	2	1	2	4	6	2	3	2	2	2	3
2 Standards - Technology Standards (Integration)	1	1	8	4	12	2	3	1	2	1	3
3 End-Uses - Authentication & Access Control	2	2	5	3	8	1.7	3	1	1	2	1
3 End-Uses - Patient and Provider Identification	1	1	15	4	19	2.3	3	2	2	2	2
3 End-Uses - Asset Management Systems	4	3				1	2	3	3	3	2
3 End-Uses - Claims & Billing Systems	3	3	1	2	3	2.2	3	2	2	2	2
3 End-Uses - Clinical Information Systems	1	2	10	3	13	1.7	3	1	2	1	1
3 End-Uses - Data Capture And Translation	3	1	0	4	4	2.3	1	3	3	3	2
3 End-Uses - Data Warehousing	2	2	3	3	6	2.7	3	3	3	3	2
3 End-Uses - Decision Support Systems	4	4	2	1	-1	2.0	2	3	3	1	2
3 End-Uses - Electronic Health Record	1	4	13	1	14	1.3	3	1	1	1	1
3 End-Uses - Finance Systems	4	3				1	2	3	3	3	2
3 End-Uses - Human Resource Systems	4	3				1	2	3	3	3	2
3 End-Uses - Patient Administration Systems	1	2	6	3	9	1.8	1	3	3	2	1
3 End-Uses - Performance Management Systems	3	3	2	2	4	2.0	2	3	2	1	2
3 End-Uses - Procurement Systems	4	3				1	2	2	2	3	2
3 End-Uses - Provision Of Health Information To Health Professionals	3	3	0	2	2	2.3	2	2	2	3	3
3 End-Uses - Provision Of Health Information To The General Public	3	3	1	2	3	2.7	2	3	3	3	2
3 End-Uses - Registries & Disease Surveillance	2	2	2	3	5	2.7	3	3	3	3	2
3 End-Uses - Secure messaging and Clinical Information Transfer	2	2	6	3	9	2.2	2	2	3	2	2
3 End-Uses - Telehealth	3	3	0	2	2	2.2	3	2	2	2	2
3 Population Surveys	2	1	3	4	7	2.3	2	2	2	3	3
4 Change Management	4	2				3	1	1	1	1	1
4 Change Management -		2	4	3	7	2.3	2	3	2	2	3
3 Statistical analysis		4	3	1	4	2.8	2	3	3	3	3
1 = significant cost and success factors not well understood 2 = requires significant resources, but success factors are well known and predictable 3 = requires modest resources and generic skills only											

## 1.6 Stakeholder Interviewees

Name	Position
Minister Tony Abbott	Federal Minister for Health & Ageing
Dr Max Alexander	Deputy CEO - Clinical Operations, ACT Department of Health and Community Care
Mr Warren Armitage	General Manager - Strategy and Information, Uniting Healthcare
Mr Paul Armstrong	Director Policy, Office of the Federal Privacy Commissioner
Ms Gloria Baillie	Katherine Health Connect Field Trial
Professor Bruce Barraclough	Chairman, Australian Council for Safety and Quality in Health Care
Mr Ching Choi	Head of Health Division, AIHW
Mr Andrew Chuk	Deputy DG, WA Dept of Health
Professor Andrew Coats	Dean, Faculty of Medicine, Sydney University & Chair of AHIC
Professor Enrico Coiera	Co-Director, Centre for Health Informatics (University of Sydney)
Mr Paul Doman	President, Medical Software Industry Association
Mr Rob Durie	Executive Director, Australian Information Industry Association
Mr Paul Fitzgerald	Director of HealthConnect, Australian Department of Health and Ageing
Professor Michael Georgeff	Faculty Information Technology, Monash University
Ms Jane Halton	Secretary, Australian Department Of Health & Ageing
Mr Tony Hayes	Director, Info & Business Management, DoH, QLD
Mr Andrew Hayne	Deputy Director Policy, Office of the Federal Privacy Commissioner
Ms Helen Hopkins	Executive Director, Consumers' Health Forum
Professor John Horvath	Chief Medical Officer, Australian Department of Health and Ageing
Mr David Johnston	CIO, Department of Human Services, SA
Dr Chris Kelman	Information and Communications Division, Australian Government Department of Health and Ageing
Professor Michael Kidd	President, Royal Australian College of General Practitioners
Mr Terry Leonard	Director of Information Policy Division, WA Department of Health
Ms Susan Linacre	Deputy Australian Statistician, Australian Bureau of Statistics
Dr Richard Madden	Director, Australian Institute of Health and Welfare
Dr Ric Marshall	Manager, Health Information & Performance Management, VIC DHS
Ms Julia Nesbitt	Policy Development, Australian Medical Association
Mr Marcel Nouvet	Assistant Deputy Minister, Information, Analysis & Connectivity, Health Canada
Dr Andrew Perrignon	CEO Northern Health (VIC)
Mr Timothy Pilgrim	Deputy Federal Privacy Commissioner
Mr Frank Quinlan	Technology Advisor, Australian Medical Association
Dr Brian Richards	CIO of HIC
Mr John Rimmer	Former CEO of NOIE
Ms Jan Robbins	Business Information Management Branch, Territory Health Services
Mr Greg Rochford	A/Deputy Director-General Health System Performance, NSW Health Department
Mr David Rowlands	Director, National InfoStructure Development, Department of Health & Ageing
Ms Lesley Russell	Policy Adviser (Julia Gillard's office)

Mr Bill Scott	President, Pharmacy Guild of Victoria Victorian Branch
Dr Merran Smith	Joint Chair, National Public Health Information Working Group (NPHIWG)
Ms Jozefa Sobski	Chief Information Officer, NSW Health Department
Professor Fiona Stanley	CEO, Australian Research Alliance For Children and Youth
Mr Ken Tallis	Head of Resources Division, AIHW
Dr Ron Tomlins	Chair, General Practice Computing Group
Mr Martin Wallace	Deputy Secretary, Department of Health & Human Services, TAS
Dr Michael Walsh	CEO Alfred Hospital, VIC
Mr Jeff Whalan	MD, HIC
Mr Peter Williams	Director IM & CS, NSW Health Department
Ms Jennifer Williams	CEO Austin Hospital, VIC
Ms Fiona Wilson	Office of Health Information Systems, VIC DHS
Dr Rob Wooding	First Assistant Sec. Info & Comms, Commonwealth DoHA
Dr John Youngman	GM Health Services Qld / Australian Council for Safety and Quality in Health Care / ICT Standards Committee



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